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THESIS

IN-PLANT QUALITY EVALUATION (IQUE)
AFTER ONE YEAR: A PROGRAM REVIEW

by

James M. Underkoffler

June, 1992

Thesis Advisor:
Co-Advisor:

Rodney F. Matsushima
Stephen Zirschky

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**IN-PLANT QUALITY EVALUATION (IQUE) AFTER ONE YEAR:
A PROGRAM REVIEW**

by

James M. Underkoffler
Lieutenant Commander, Supply Corps, United States Navy
B.S., Ball State University

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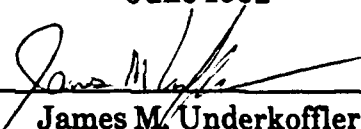
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Author:


James M. Underkoffler

Approved by:


Rodney F. Matsushima, Thesis Advisor


Stephen Zirschky, Thesis Co-Advisor


David R. Whipple, Chairman
Department of Administrative Sciences

ABSTRACT

In-Plant Quality Evaluation (IQUE) is the method by which Government quality assurance personnel assess contractor control over product quality. This study examines the opinions of field level personnel about the accomplishment of IQUE stated goals. The results of surveying over 300 Government and contractor quality assurance representatives are reported. It was concluded that the stated goals of IQUE have not been attained. The majority of respondents felt a period of two to three years was required before a determination of the program could be made. Improved communications and the focus on teamwork by IQUE were found to be significant contributors to improvements in the adversarial relationships found between many Government contractors and the Government.

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I. INTRODUCTION

A. BACKGROUND

A recent audit of "on the shelf" spare parts at one of the Department of Defense's (DoD) wholesale inventory distribution centers, revealed that only eight percent of the machine gun parts sampled conformed to the required specifications. Of the \$110 million worth of machine gun spare parts stocked at the center, \$14 million were projected to be nonconforming. [REF 1:6] The audit concluded that the DoD Quality Assurance System is not working as intended and that DoD did not receive the quality parts they paid the contractors to produce.

The audit was answered by the Assistant Secretary of Defense for Production and Logistics, The Honorable Jack Katzen, by stating a change in quality philosophy through a move to "in-process controls", and the implementation of that philosophy through Total Quality Management (TQM), would resolve the problem of nonconforming material within DoD depots. This TQM philosophy change has resulted in the In-Plant Quality Evaluation Program (IQUE) implementation by the Defense Logistics Agency's Defense Contract Management Command (DCMC).

B. OBJECTIVE OF THE RESEARCH

The purpose of this research was to evaluate the extent to which the In-Plant Quality Evaluation program has attained its goals, in the opinion of the DCMC Quality Assurance Representatives (QAR). The DCMC QARs have had approximately one year to implement the IQUE program and observe the results. This study collected and analyzed the opinions of both the Government and the private industry QARs in regards to the stated program goals.

C. THE RESEARCH QUESTIONS

Given the preceding objectives, the following primary research question was posed: To what extent has the In-Plant Quality Evaluation program attained its goals?

The following subsidiary research questions are pertinent to this research effort:

1. What is IQUE?
2. What are the goals of IQUE?
3. What is the reaction of Government contractors to IQUE?
4. What have been the negative effects of implementing IQUE?
5. What benefits has IQUE provided to DoD and DoD contractors?

D. SCOPE, LIMITATIONS AND ASSUMPTIONS

A comparison of the goals of IQUE with the results of its implementation was the major thrust of the thesis and incorporated a comparison between the quality program prior to implementation of IQUE and the current program. The thesis analyzed the IQUE program implementation on the basis of the opinions of the surveyed QARs and identified the negative effects and benefits of the program on a non-quantitative basis. This thesis limited the opinion pool to the Defense Contract Management Area Operations (DCMAOs) offices within the Defense Contract Management Command (DCMC) and did not include the Defense Contract Management Command International nor the Defense Plant Representative Offices (DPRO). The basic assumption of the thesis is that as the field representative, the Quality Assurance Representative (QAR) is best qualified to render opinions on the effectiveness of the IQUE program. The widest coverage of Quality Assurance Representatives would be at the DCMAO level.

E. METHODOLOGY

The methodology of this thesis included both an extensive literature search and data collection by means of a survey.

The literature search consisted of professional journal articles, directives, regulations, audit reports and books available through the Naval Postgraduate School Library and the Defense Logistics Studies Information Exchange (DLSIE).

The data collection was composed of survey questionnaires distributed to DCMAO level Quality Assurance personnel and their Government contractor counterparts. These individuals were chosen because of their participation in the actual implementation of the IQUE program. The process was initiated by distribution of questionnaires to Government quality assurance personnel accompanied by contractor questionnaires to be distributed by the cognizant QAR to the contractors over whom they have responsibility. This process is an attempt to develop a commonality between responses while soliciting maximum participation and to avoid the reluctance of Government offices to provide contractor names and addresses to a third party.

F. ORGANIZATION OF THE THESIS

Chapter II is a background of the In-Plant Quality Evaluation program and provides a comparison of the differences between the new system and old, an overview of quality requirements in Government contracts, and examines the possible problems with IQUE.

Chapter III presents the data collected from the survey of quality personnel at the field level. The specific tendencies of the questionnaire will be presented in numerical and graphical format along with comments provided by the respondents.

Chapter IV analyzes the results of the questionnaire.

Chapter V provides conclusions drawn from this research and specific recommendations that result from the research. The research questions are answered and recommendations for further research presented.

II. BACKGROUND

A. INTRODUCTION

Few in DoD today have not heard of the management theory that has been called by many names and is one of the most significant of recent policy changes. Whether called Strategic Quality Control, Total Quality Management or Total Quality Leadership, the theory is the same; one based upon the theoretical issue of process variation. [REF 2:13]

Generally attributed to then Secretary of Defense, the Honorable Frank Carlucci, the adoption of the TQM philosophy by DoD has been officially recognized as in process since 1988 when Secretary Carlucci issued the "Department of Defense Posture on Quality". This letter also set forward functional responsibility and for the first time pointed out that quality in weapon systems is central to the DoD mission. [REF 3:34]

Secretary Carlucci was joined in the effort by then Under Secretary of Defense for Acquisition, the Honorable Robert Costello. Together they proposed a number of reforms targeted at lowering acquisition costs while improving both the quality of material and the procurement process. [REF 4:274]

In a review of the reforms proposed, Gabor identifies one of the most important as:

One of the more important reform measures involves DoD's determination to introduce the practice of controlling and reducing variation as one of its procurement criteria. To this end, DoD is trying to eliminate traditional specifications for Acceptable Quality Levels (AQL), which specify the number of permissible defects. AQL has led contractors to become "complacent with a "good enough for the government" concept, and [to] los[e] sight of good business practices," writes Jack Strickland, the Pentagon's top quality and productivity official. Instead DoD is encouraging suppliers to use SPC to reduce variation in their processes and to pursue quality improvement. [REF 4:275]

This use of Statistical Process Control (SPC) by DoD has brought about a change in quality philosophy towards the prevention of nonconformance rather than detection. This philosophy change has been implemented through the use of Total Quality Management (TQM).

With the adoption of Total Quality Management by the DoD and the commitment to implementing it in all phases of management, this philosophy no longer only covers the manufacturing process, but has expanded into all aspects of DoD business. As a result of this universal application, the TQM concept is now being used by the Defense Logistics Agency (DLA) to manage quality assurance. This TQM philosophy change has resulted in the In-Plant Quality Evaluation Program (IQUE) implementation by the Defense Logistics Agency's Defense Contract Management Command (DCMC). The IQUE program is being

utilized to assure effective process control within all Government contractors' quality assurance processes as well as manufacturing processes.

B. SYSTEM FAILURE

In 1988 the General Accounting Office released a report that had been designed to evaluate the quality assurance issues with the Phoenix, the High-Speed Anti-Radiation Missile, the Harpoon, and the Sparrow missiles. The emphasis of the report had been placed on the extent, seriousness, effects and the cause of quality problems in the production of the missiles. DoD structure and contractor quality assurance organizations were also addressed in the report.

The General Accounting Office concluded, in part, that in one respect or another all four missile systems failed to conform with contract specifications. Some of the more serious discrepancies were caused by inadequate quality oversight and poor manufacturing at the subcontractors while others were caused by inadequate manufacturing processes at the prime contractor.

That audit report was only one of a series of audit reports that dealt with Government contractor product quality standards. However, the audit report was the first that linked the second tier contractors' quality problems directly into the weapon systems problems. Prior audit reports in this series dealt, for the most part, with spare parts and depot

stock items found to be nonconforming and the methods for reporting those nonconformances within the DoD. [REF 1:126]

The audit of "on the shelf" spare parts discussed in Chapter I concluded that the DoD Quality Assurance System was not working as intended and that DoD did not receive the quality parts the contractors had been paid to produce.

These audits were only two out of a series of audit reports on quality issues done by the Inspector General and General Accounting Office. Some of the additional audits that define the failure of the quality assurance system as it existed at the time are as follows:

1. Procurement Quality Assurance of Material Receipts by Corpus Christi, Texas, Army Depot.

This audit found that, due to inadequate manufacturer quality control and less than effective enforcement of quality assurance procedures by DoD officials, a single manufacturer shipped \$3 million of defective parts to the depot between October 1981 and March 1993. [REF 1:124]

2. Defective Parts on the Navy's Light Airborne Multi-purpose System MK III Program.

This audit found that the Navy had repaired, at Government expense, defective parts received by a prime contractor instead of determining the cause or source of the defective parts and whether the source should have repaired the defects at their own expense. The findings determined an amount of two million dollars had been spent on these repairs. [REF 1:124]

3. Processing of Quality Deficiency Reports in the Defense Logistics Agency.

This audit found that 57 percent of the quality deficiency reports sent to two separate Defense Contract Administration Services Regions (DCASRs) contained inaccurate or improper information or were insufficient to determine the cause of the reported deficiency. [REF 1:124]

4. Quality Assurance Efforts to Strengthen DoD's Program.

This report stated that the DoD In-Plant Quality Assurance Program was not as effective as it should have been in ensuring the delivery of quality products. The report further stated that the Government Quality Assurance Representative office did not implement Federal Acquisition Regulation requirements pertaining to verification of quality conformance to contract specifications. The audit also found the Representative offices did not discourage the repeated submission of minor nonconforming material or have a system to identify recurring quality problems. Plant Representatives had even delegated inspections to contractors and did not perform mandatory inspections. [REF 1:125]

5. Follow-on Audit of Known But Unreported Defective Material.

This was a follow-on report to the Inspector General's Report No. 86-131, "Processing of Quality Deficiency Reports in the Defense Logistics Agency." This report concluded that the number of unreported but known defective items, as well as the money the Government spent to repair them was small. The report also reemphasized the need for the Services to prepare quality deficiency reports when defective material was found. [REF 1:125]

6. Procurement - Department of Defense Quality Assurance Efforts.

This report was a "fact sheet" that stated the Defense Logistics Agency and the Services did not have enough data to reliably estimate the total amount of or the value of nonconforming material that may be in inventory. It also stated that the Quality Deficiency Reporting System is not always a reliable means of identifying nonconforming goods. The report also stated that there was no DoD-wide contractor quality history system primarily because the Services and the Defense Logistics Agency were unable to agree on how the data in a DoD-wide system would be compiled and maintained. [REF 1:127]

These audits and the "on the shelf" spare parts audit were used in testimony before the United States Senate Committee on

Governmental Affairs where the Honorable John Glenn said in his opening statement as Chairman:

I want to know why we are accepting substandard parts. This is not cinder block; we are buying stuff you need when someone is shooting at you, and you need to shoot back.

These examples demonstrate that we have a serious waste and quality assurance problem in our military spares. This is an unacceptable way of doing business. [REF 1:2]

Testimony from the Assistant Secretary of Defense for Production and Logistics, the Honorable Jack Katzen, stated a change in quality philosophy through a move to "in-process controls" and the implementation of that philosophy through TQM would resolve the problem of nonconforming material within Department of Defense depots. This TQM philosophy change has resulted in the IQUE implementation by the DCMC.

C. IN-PLANT QUALITY EVALUATION (IQUE)

1. What Is IQUE?

Known as the In-Plant Quality Evaluation Program, it is designed under the overall umbrella concept called Exemplary Facilities (EF) which recognizes a contractor's adoption of TQM practices with the concept that movement toward contractor self-governance through TQM can result in the reduction of Government oversight. IQUE focuses on the understanding, measuring, and analyzing processes, in lieu of emphasis on end item inspection. IQUE was developed to address three major

concerns identified by DLA in a review of practices directed at improving customer satisfaction. These are:

1. Audits of several DLA depots indicated an unacceptable level of in-stock nonconforming parts.
2. The QA workload had increased without a commensurate increase in personnel.
3. The military departments continued to complain that all DLA QARs did was check paper. [REF 5:7]

IQUE was established as one of the principal initiatives of the DCMC in its move toward contractor self-governance. IQUE uses the concepts, philosophies and tools of Total Quality Management to assess contractor controls over product quality. This program was scheduled to complete implementation in more than 19,000 contractor plants by June 1991.

2. What Are The Goals Of IQUE?

The primary objective of the IQUE program has not changed from that of the previous program (Contractor Quality Assurance Program (CQAP)). The primary objective of IQUE is to ensure the acceptance of conforming products. In order to achieve this objective, IQUE has defined the following goals:

1. Achieve customer satisfaction.
2. Improve product quality.
3. Effect a reduction in the costs of items and ownership. [REF 6:Forward]

IQUE assesses the contractor's control over product quality by focusing on the spirit of team work to measure and continuously improve processes and the resulting product quality.

IQUE is designed to assess the adequacy of a contractor's processes to conform in a consistent manner to the requirements of a contract, through the use of statistical techniques and auditing principles. It recognizes the importance of familiarity with the contractor's processes and stresses the importance of a thorough contractual requirement review by QA personnel. It also focuses on assuring that the contractor has an in-depth process for reading contracts, in order to ensure adequate planning on the part of the contractor for all contracts. [REF 6:1-101]

The IQUE program utilizes a process of proofing to assess the effectiveness of a contractor's ability to accurately and effectively transform inputs into products. "Government in-plant QA personnel proof the adequacy of the contractor's processes by thorough review of their processes to determine that the inputs being employed are adequate to achieve the desired outcome". [REF 6:1-102b]

The primary element for product acceptance is the product audit. [REF 6:103] As expressed in Defense Logistics Agency Manual (DLAM) 8200.5, In-Plant Quality Evaluation, 1-103:

Product audits are examinations or tests of process outcomes performed on a continuing basis subsequent to contractor examinations or tests. They are used to gain assurance of consistent conformance to contract requirements and serve as the primary element for product acceptance. Unlike the examinations and tests performed as part of process proofing, product audits are not necessarily conducted at each stage in a process. They usually assess the overall effectiveness of contractor measurements over an entire process.... The product audit assesses the contractor's ability to measure the process effectively by examining or testing product that the contractor has previously determined to be conforming.

D. CONTRACTOR QUALITY ASSURANCE PROGRAM (CQAP)

The Contractor Quality Assurance Program was dependent on the contractor's ability to detect nonconforming material before presentation for acceptance by the Government. Although often criticized as a program that attempted to inspect quality into the product, a look at the customer's reactions to the program reveal differing attitudes. [REF 5:7] Under the CQAP program the QAR normally did not perform the final inspection of the parts themselves, but concentrated the inspection on the paperwork associated with the parts.

[REF 5:7] The contractor's quality control systems and certifications of inspection presented by the contractor may receive closer inspection than the part that is being

accepted. Depending on the required level of quality assurance called out by the contract, the level of inspection by the QAR would vary greatly.

E. QUALITY ASSURANCE SYSTEM

1. Standard Inspection

The Standard Inspection Clause called for in Part 46 of the Federal Acquisition Regulation (FAR) allows for a commercial type inspection prior to acceptance. The Standard Inspection Clause may allow for only a commercial type inspection prior to acceptance but it establishes the right of inspection in procurement exceeding the small purchase threshold.

The remaining levels of quality assurance are characterized by an increased oversight by the QAR and additional requirements placed upon the contractor. The higher level quality requirements made up of MIL-I-45208A and MIL-Q-9858A have significantly higher level of requirements. They require continual oversight of the contractors' quality programs and a Governmental approval of the system prior to procurement. The Quality Assurance System can be thought of as a pyramid with the standard inspection clause being the base with each higher level of inspection built on the other. MIL-I-45208A has its own requirements plus those of the standard inspection clause and MIL-Q-9858A contains, in addition to all

the provisions of MIL-Q-9858A, all that is in MIL-I-45208A plus all that is in the Standard Inspection Clause.

2. MIL-I-45208A

The major requirement of MIL-I-45208A is the establishment of an inspection system. It pertains to inspections and tests necessary to substantiate product conformance to drawings, specifications and contract requirements. This system must have documentation of the test procedures and criteria used for inspections. Records of the inspections performed, the results, and corrective action taken on deficiencies, are also required. MIL-I-45208A also provides the option to use MIL-Q-9858A in whole or part whenever MIL-I-45208A is required. [REF 7:1.2.3]

3. MIL-Q-9858A

MIL-Q-9858A adds the requirement for a quality program that is of sufficient internal organizational freedom to identify and correct quality problems. This program must be able to identify the cost of quality and provide statistical quality control and analysis along with process control.

The specification MIL-Q-9858A has been the normal way in which process control was introduced as a contractual requirement.

F. DoD QUALITY POLICY

It is the policy of the Department of Defense to:

1. Develop and manage a cost effective quality program to ensure that contract performance conforms to specific requirements. Apply the quality program to all contracts for services and products designed, developed, purchased, produced, stored, distributed, operated, maintained, or disposed of by contractors.
2. Conduct quality audits to ensure the quality of products and services meet contractual requirements.
3. Base the type and extent of Government contract quality assurance actions on the particular acquisition.
4. Provide contractors the maximum flexibility in establishing efficient and effective quality programs to meet contractual requirements. [REF 8:246.102]

Another important provision of policy is that the DoD FAR Supplement provides the Government a means to hold contractors responsible for the quality of products and services. These are the use of contract provisions that place the responsibility on contractors; the exercising of the Government's rights in rejecting or returning defective items for repair, correction or replacement; and warranty clauses.

The DoD FAR Supplement (DFARS) also provides policy guidance that considers more nonstandard types of assurance, in that it directs consideration of contractual means to encourage excellence in contractor quality efforts; recommends consideration of a reduction in Government surveillance when

The DoD FAR Supplement (DFARS) also provides policy guidance that considers more nonstandard types of assurance, in that it directs consideration of contractual means to encourage excellence in contractor quality efforts; recommends consideration of a reduction in Government surveillance when the contractor's quality performance indicates; and directs consideration of other noncontractual motivation techniques.

G. COMPARISON OF THE PROGRAMS

The primary objective of IQUE and CQAP, acceptance of conforming products, and complete compliance with the terms of the contract, are simply two ways of restating the requirements of the FAR and DFARS. The main difference between the two programs is the inclusion of three factors into IQUE. The three factors are:

1. Success through process control.
2. Teamwork between the contractor and the Government.
3. Defect prevention instead of defect detection.

1. Process Control

Process control is the main focus of IQUE and industry defines TQM as being centered around the concept of defect prevention through process control versus the traditional defect detection through inspection. [REF 9:2]

Prior to IQUE the only mention of process control was in higher level quality requirements. MIL-I-45208A includes

2. Contractor/Government Teamwork

Although the forward of DLAM 8200.5 provides for a warning that teamwork is not to be construed as authority to change the terms of any contract, a QAR who follows the program and issues a Continuous Improvement Opportunities(CIO) could run the risk of interpretation as direction and the resultant risk of a directed change order. IQUE not only assesses contractor control over product quality but recommends participation by the QAR in the improvement of the processes. This is yet to be challenged in the courts, but any direct involvement of Government officials in the performance of a contract as suggested by the teamwork concept is increasing the risk of claims or requests for equitable adjustments.

The previous quality assurance system concentrated on rigid application of static standards set by regulations. The conflict created by this policeman attitude is one of the contributing factors to an adversarial relationship between the Government and the contractor. [REF 10:52]

IQUE has placed an emphasis on cooperation and communication to foster teamwork between the contractor and the Government representatives that is intended to provide a counter to this adversarial relationship.

3. Defect Prevention Or Defect Detection?

The Contractor Quality Assurance Program could be characterized as a defect detection system whereas the IQUE program is one of defect prevention.

A defect detection system is a system that relies on large numbers of items being inspected after the manufacturing process has taken place or at least a major portion of a manufacturing process has occurred and significant costs have been incurred. In some instances these inspections can include 100% of the material in the effected manufacturing cycle. This end of process inspection can lead to duplication of effort as the manufacturer inspects incoming material that the vendor inspected prior to shipment or as one division inspects before and after performing a process. In an effort to control costs or production schedules these type of systems often have a tendency to cut back on inspections or reduce standards at the expense of the final item quality. [REF 11:387]

A defect prevention system tends to detect process problems where nonconformances are produced thus limiting the cost incurred in an inefficient process. By using statistical process control (SPC), a technique is applied which samples small quantities of output on a continuous but periodic basis. If a variance is found that is outside of established parameters, the process is stopped and corrective action is taken to prevent the further production of nonconforming

items. This stopping procedure, while integral to the prevention of defects, also incurs a cost in itself. This cost is in the form of nonproductive time. The comparison of the cost of this nonproductive time versus the cost of reworking defective items produced by a defect detection system is where the advantage of defect prevention systems are realized. The operator is able to detect the problem, stop the process, make corrections and continue production with few defective products. [REF 11:392]

H. SUMMARY

This chapter has provided a historical perspective on the formation of the IQUE program. A description of the major requirements that must be incorporated in any quality assurance system and a comparison of IQUE and CQAP was presented.

Chapter III will present the data collected from a survey of field level personnel.

III. PRESENTATION OF DATA

A. INTRODUCTION

In order to determine the extent to which the IQUE program has achieved its stated goals, a cross section of QARs and contractor personnel were provided a questionnaire which solicited the opinion of the field level personnel. The questionnaire contained 13 statements that the respondents were asked to indicate a level of agreement or disagreement with, on a scale from one to five. A rating of three was designated as a neutral response, a rating of one was designated as "strongly agree" and a rating of five was designated as "strongly disagree."

The survey was designed to determine if the IQUE program has reached its stated goals. Central to this study is the assumption that the field level personnel would be best able to provide that determination. A copy of this survey is presented as Appendix A.

1. Distribution of the Survey

Each Defense Contract Management Area Operations (DCMAO) office received thirty questionnaires for distribution. The distribution was left to the individual DCMAO to determine the appropriate personnel to survey. The suggested method was to distribute two surveys to each of 15 QARs and have the

individual QAR complete one survey and request a contractor under his cognizance to fill out the second. To provide anonymity, each survey contained a pre-addressed envelope with postage for return directly to the researcher. These envelopes were provided in an attempt to increase the response on the part of both the Government and the contractors. It was hoped that by having surveys distributed to a QAR and his cognizant contractor that a more accurate picture of the opinions on both sides would develop.

Distribution to the 40 DCMAOs listed in Defense Logistics Agency Handbook (DLAH) 4105.4, DoD Directory of Contract Administration Services Components, dated January 1991, resulted in the return of two survey packages as one DCMAO had been dissolved and one transferred to DCMC International. The final distribution included a total of 1,140 surveys to 38 offices.

2. Response

From the distributed surveys, responses were received from 230 Government personnel and from 95 private contractors for a total response of 325 surveys. The 325 survey responses represent over 78 percent of the offices surveyed and 28.5 percent of the distributed questionnaires.

Some of the surveys had to be interpreted by the researcher before the individual survey was included in the overall result. These interpreted surveys included both

incomplete surveys, where comments were provided but no indication of a rating was provided, and surveys where the respondent had misinterpreted the desired rating system, providing both a response indicating a rating and an indication of agreement or disagreement with the statement. In the case of incomplete answers, those missing a rating response, the value three was used by the researcher to avoid influencing the resultant frequency distribution in either the direction of agreement or disagreement. The misinterpreted rating system was interpreted using a value of two if agreement was indicated by the respondent and a value of four if the respondent indicated disagreement. This validation of responses was undertaken in order to utilize all of the surveys received and to provide for a conservative direction of error if any was introduced by the interpretation of responses by the researcher.

The rate of return from the DCAMOs was computed by comparing the post mark on the return envelop with the assignment of DCMAO by Zip code as provided in DLAH 4105.4 to determine the cognizant DCMC office. It may contain some error depending on the accuracy of this system. It is the researcher's opinion that the response rate is of a sufficient quantity to provide a valid sample.

B. QUESTIONNAIRE RESPONSES

1. Statement One; IQUE Has Decreased The Number Of Nonconforming Products.

The intent of this statement is to solicit an opinion as to whether or not the IQUE program has been responsible for a reduction in the number of nonconformances. Nonconformances are an indication of an out of control process. This question therefore was used as an indication of the achievement of goal number two; improve quality through improved processes. The results of the survey expressed as a percentage of respondents are provided as Table I and translated into Figure 1 to provide visual reference.

TABLE I RATINGS AS A PERCENT OF TOTAL RESPONSE.

Rating	1	2	3	4	5
Combined	6.77%	18.77%	45.86%	19.69%	8.92%
Contractor	10.53%	24.21%	46.32%	13.68%	5.26%
Government	5.22%	16.52%	45.65%	22.17%	10.43%

a. Government Responses

Some typical comments received that are indicative of the majority of responses are provided below:

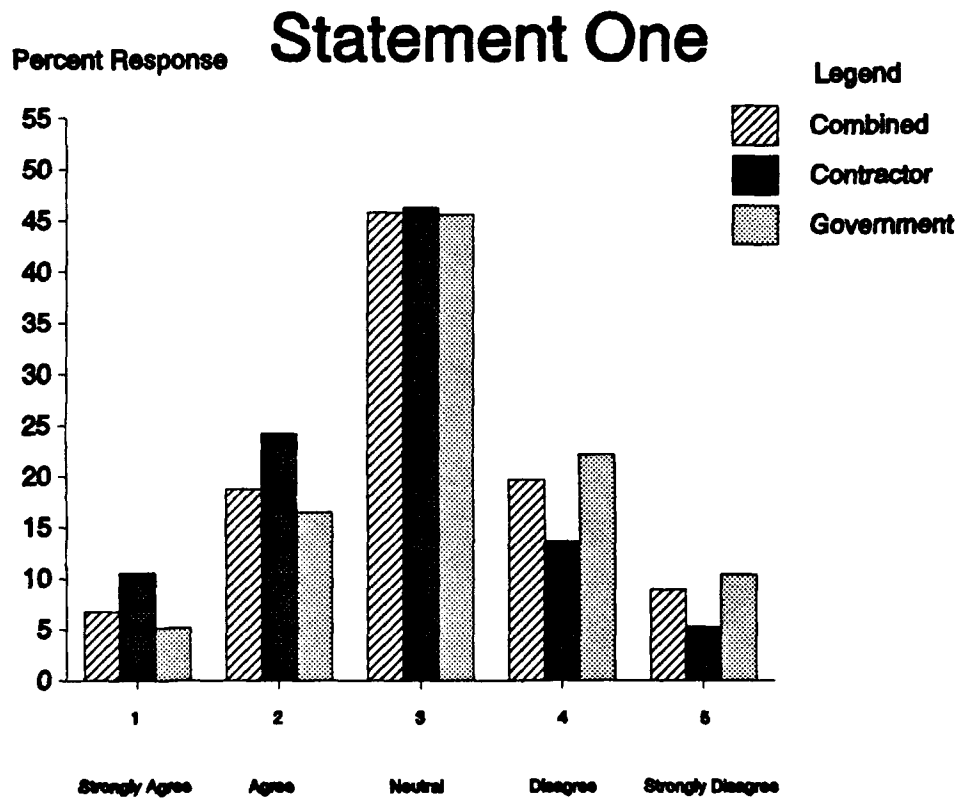


Figure 1 Statement number one.

IQUE is too new to determine if it has resulted in a decrease of nonconforming material.

Not yes, not no. The contractors assigned to me were performing well at the time IQUE was implemented. I've not seen an increase in performance.

Non-resident QARs do not have the expertise nor the time to fully implement IQUE. More guidance is needed at the individual facility.

To date we have not seen large decreases in nonconformance. However over a longer time period I expect to see more results in this area.

Nonconformances still exist, however, disposition and corrective action is faster since you can work with the individuals and their team leaders.

Data do not support a decrease in the number of nonconforming products. However, it does support that the severity of identified nonconformances has decreased.

IQUE program was initiated less than 16 months ago at this contractor facility. Although there has not been any noticeable change in the numbers of nonconformances at this time, an improvement is expected when the program is fully implemented.

b. Contractor Responses

Some typical comments received that are indicative of the majority of responses are provided below:

The Government method of surveillance hasn't increased (or decreased) the quality as the contractor QA organization is still responsible to assure the manufacturing function is producing a quality product.

Our basic quality system has not changed much since the start of IQUE. We must still comply with MIL-Q-9858A. [The] biggest impact has been flow charting processes that are already working.

Many changes are occurring. No way to attribute increase/decrease in nonconformances directly to IQUE.

Not seen as a driver of this attribute at this facility. It certainly promotes reduction of noncompliance via prevention. Maybe it is just too early yet.

IQUE has allowed Government and contractor to work closer as a team and decide jointly where to apply resources.

IQUE should not have any affect on nonconforming products produced by a contractor. The contractor is responsible for reducing their defects, not IQUE and the Government.

IQUE has not greatly affected either the quality of nonconformances or the system that governs the way they are handled. Reduction in nonconformances have been achieved through contractor TQM/Corrective action efforts. These efforts have been successful partially because of improved contractor/Government relations.

Too soon to tell. The concept promotes process improvement, but to date it has been everything a QAR can do to understand the process.

Our customer return rate has always been low; there has been no noticeable differences although the number of minor nonconformances identified prior to shipment has increased.

2. Statement Two; IQUE Has Reduced The Cost Of Products.

The intent of this statement was to solicit an opinion on the cost savings of the IQUE program. This question relates directly to the third goal of IQUE; to reduce the cost of items and ownership. The results of the survey expressed as a percentage of respondents are provided as Table II and translated into Figure 2 to provide visual reference.

TABLE II RATINGS AS A PERCENT OF TOTAL RESPONSE.

	1	2	3	4	5
Rating					
Combined	5.54%	17.23%	41.54%	20.31%	15.38%
Contractor	7.37%	30.53%	34.74%	20.00%	7.37%
Government	4.78%	11.74%	44.35%	20.43%	18.70%

a. Government Responses

Some typical comments received that are indicative of the majority of responses are provided below:

The effect of long term costs cannot be determined at this time. However, I doubt costs will increase.

IQUE should reduce the cost in time. I don't believe it [has] been in place long enough yet.

With a reduction in nonconforming material, it would appear that cost would go down. I feel it is a little early in the program to see significant results.

I don't believe IQUE has progressed to the point where all contractors have improved to the level where competitive bidding has lowered prices. If by helping contractors produce more efficiently they save money, I believe at first they would pocket the profits.

No. Simply because the contractor has to make many changes to his system. However, once the initial cost of change is over , yes cost should come down.

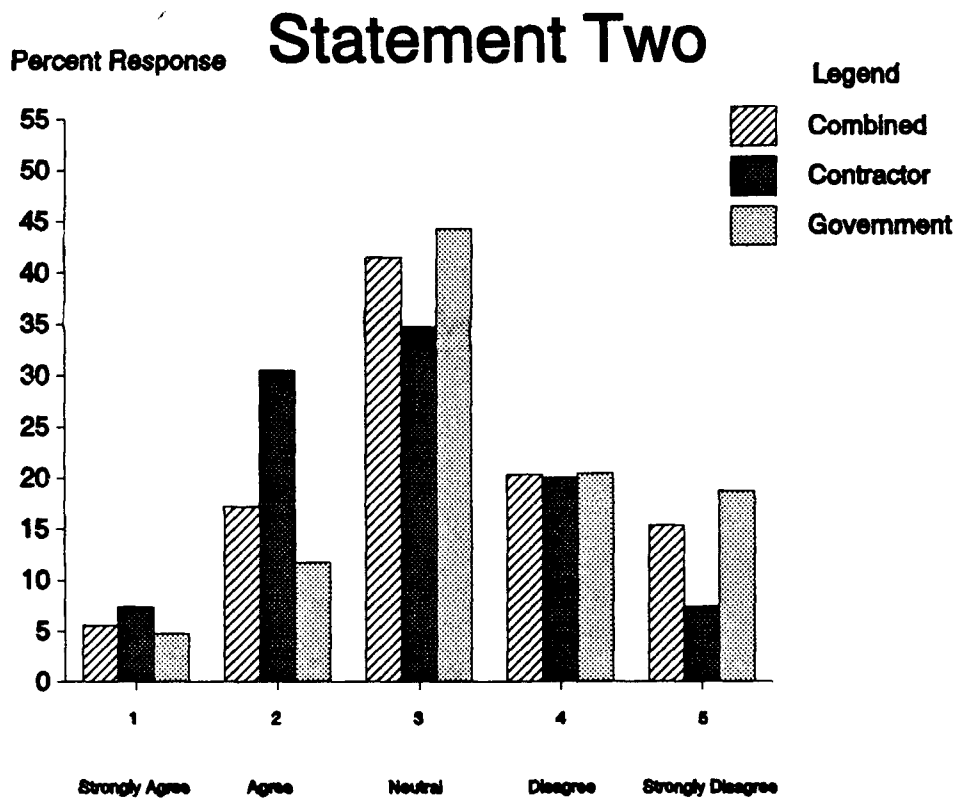


Figure 2 Statement number two.

Cost is still hinging upon full implementation of prevention. However, I anticipate lower costs.

b. Contractor Responses

Some typical comments received that are indicative of the majority of responses are provided below:

I don't think costs have been reduced yet. We have to get farther down the road.

Right now costs of inspection & Quality Deficiency Reports (QDR) responses [are] being applied to fixing process. In [the] next two years costs should come down.

Too early to tell. I spend much less time answering QDRs (creative writing 101) and more time discussing the solutions with my DCAMO counterpart.

3. Statement Three; IQUE Has Improved The Relationship Between The Government And Industry.

The intent of this statement was to solicit an opinion on the focus of IQUE as defined in DLAM 8200.5; spirit of teamwork to measure and continuously improve processes and resulting product quality. The results of the survey expressed as a percentage of respondents are provided as Table III and translated into Figure 3 to provide visual reference.

TABLE III RATINGS AS A PERCENT OF TOTAL RESPONSE.

Rating	1	2	3	4	5
Combined	33.85%	36.31%	17.23%	8.31%	4.31%
Contractor	42.11%	32.63%	13.68%	6.32%	5.26%
Government	30.43%	37.83%	18.70%	9.13%	3.91%

a. Government Responses

Some typical comments received that are indicative of the majority of responses are provided below:

The adversarial relationship which was present under the more traditional system has been replaced by a partnership which has been mutually beneficial.

The relationships between the QAR and the contractor can only improve because the old program, indirectly, created an adversary relationship. Comments like "I'm going to shut them down" or "how many parts are you going to reject today" were common place in the office and the contractor's plant.

In the past, some, including myself, would work with the contractor to solve problems. Now, it is just legal.

Communication is more open. Before IQUE most conversation was when an actual problem had occurred. Now, we can alert the contractor to potential problems, make recommendations and offer, in some cases, a plan of attack to avoid or correct present or future problems.

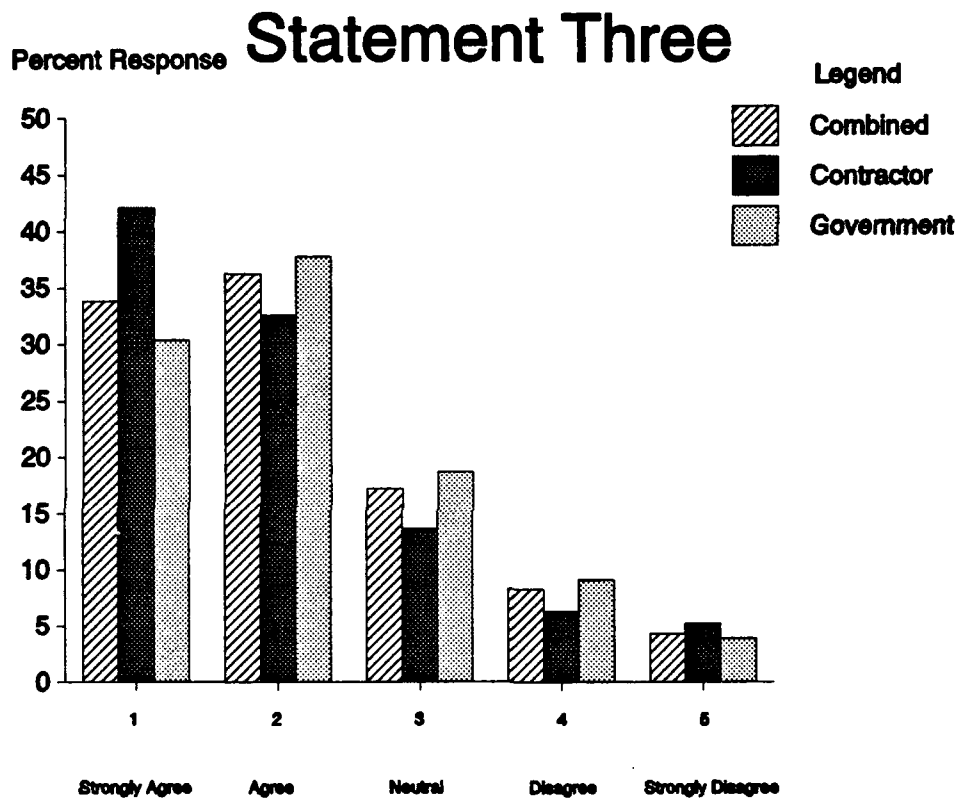


Figure 3 Statement number three.

b. Contractor Responses

Some typical comments received that are indicative of the majority of responses are provided below:

The atmosphere with DCMAO is now one of teamwork rather than of antagonism. The Government looks to help the contractor and realizes the contractor is more of an expert in its prospective industry.

The threat of QDRs has been removed, allowing communications, resulting in trust & teamwork.

Most important! There is a 100% change in the relationship from two years ago. With nearly thirty years in quality this is the best working team I've seen!

Us/them eliminated. Teamwork in delivering a quality product. Fears/barriers are removed. Suggestions for continuous improvement are welcome.

4. Statement Four; Product Quality Has Improved As A Result Of IQUE.

The intent of this statement was to solicit an opinion on the second goal of IQUE; improve product quality through improved processes. The results of the survey expressed as a percentage of respondents are provided as Table IV and translated into Figure 4 to provide visual reference.

TABLE IV RATINGS AS A PERCENT OF TOTAL RESPONSE.

Rating	1	2	3	4	5
Combined	11.38%	25.23%	41.23%	11.69%	10.46%
Contractor	16.67%	26.67%	40.00%	6.67%	10.00%
Government	9.36%	24.68%	41.70%	13.62%	10.64%

a. Government Responses

Some typical comments received that are indicative of the majority of responses are provided below:

Too early in the program to tell.

There is improvement anticipated. However, until analysis can be performed, improvements (that is, improving the current process) are basically at a standstill.

I don't think we've seen much improvement yet, but some defect reduction teams are forming currently.

Once IQUE has reached "level five" or statistical process control methods and the contractor has incorporated this concept into the facility, product quality will improve.

We have noticed small changes in the contractor's system. Their willingness to make quicker process changes as a result of confidence gained with our open working relationship.

I do feel that IQUE will result in an overall improvement in quality. I do not feel that we have given the program enough time to prove itself yet.

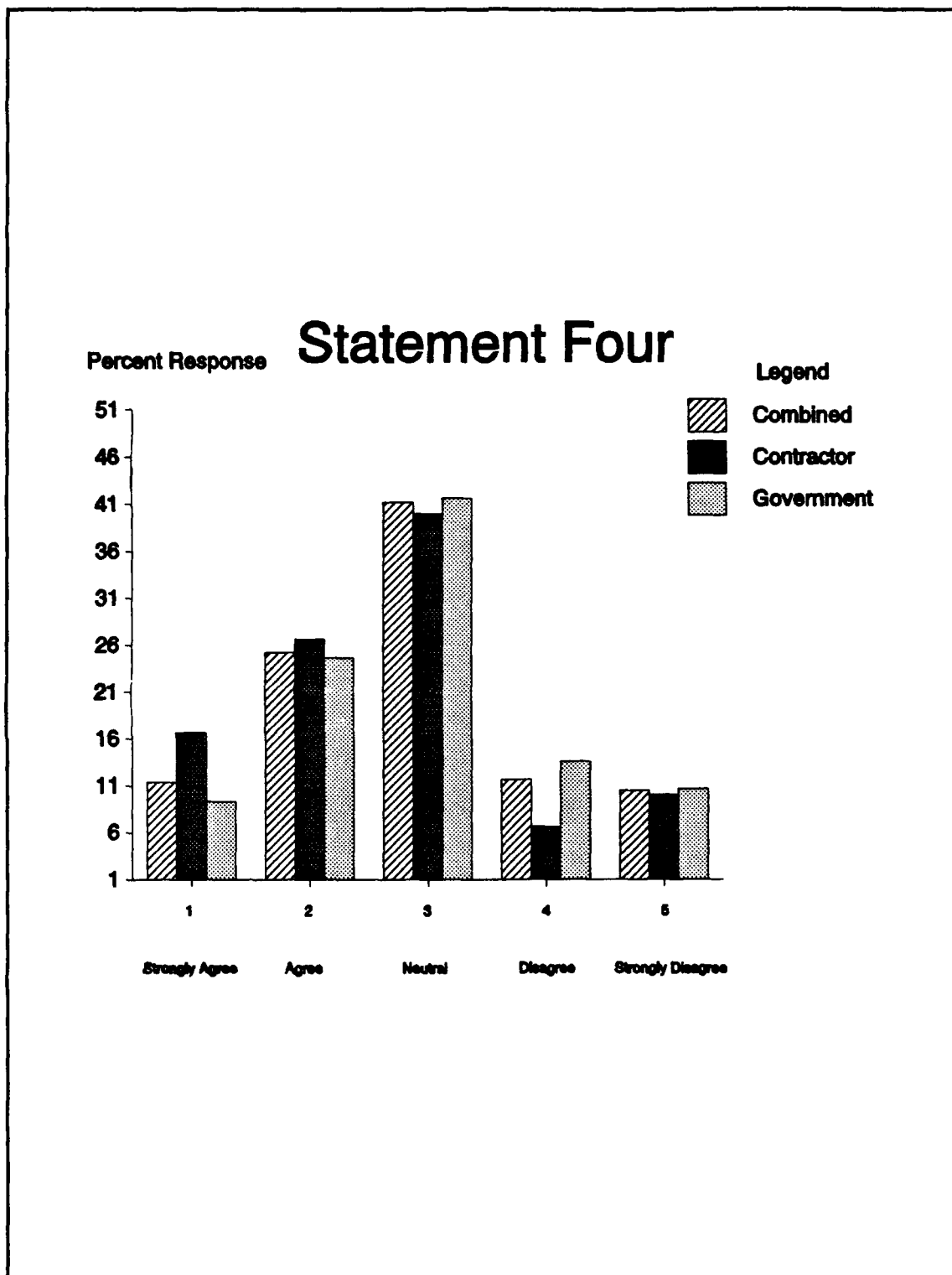


Figure 4 Statement number four.

b. Contractor Responses

Some typical comments received that are indicative of the majority of responses are provided below:

Improvement anticipated due to a better communication channel and more "heads" for new improvement ideas.

I anticipate an improvement. We are too early in the growth curve for an accurate assessment.

Some improvement seen but too little experience due to short time IQUE has been in effect.

No change in product quality. However, a great improvement in the understanding of the processes involved in achieving improved product quality.

Product quality is being improved as a result of contractor initiated quality improvement initiatives not necessarily related to Government IQUE activities.

5. Statement Five; IQUE Has Fostered The Spirit Of Teamwork Between The Government And Industry.

The intent of this statement is to solicit an opinion as to the accomplishment of the stated focus of IQUE. As stated in the forward of DLAM 8200.5, "It focuses on working with the contractor in a spirit of teamwork to measure and continuously improve processes and resulting product quality." The results of the survey expressed as a percentage of respondents are provided as Table V and translated into Figure 5 to provide visual reference.

TABLE V RATINGS AS A PERCENT OF TOTAL RESPONSE.

Rating	1	2	3	4	5
Combined	32.62%	33.23%	20.00%	9.54%	4.62%
Contractor	45.56%	27.78%	13.33%	10.00%	3.33%
Government	27.66%	35.32%	22.55%	9.36%	5.11%

a. Government Responses

Some typical comments received that are indicative of the majority of responses are provided below:

The stated objective is for Government/contractor cooperation. This is expounded by the DCMC facilitator, at least in our area.

The company invites the Quality Assurance Specialist (QAS) to be a part of their problem solving team and all information is shared freely.

I have been more willing to cooperate than under the CQAP system. Teamwork can only go so far without jeopardizing the Government position as a customer.

Contractors in the past have kept problems hidden from the Government representative because they feared adverse actions. This is going away some.

Teamwork existed already ...all of us realizing that we were all trying to keep the shuttle flying and the astronauts safe. IQUE/TQM has legitimized this cooperative attitude and freed us from some former views of heavy handed Government management.

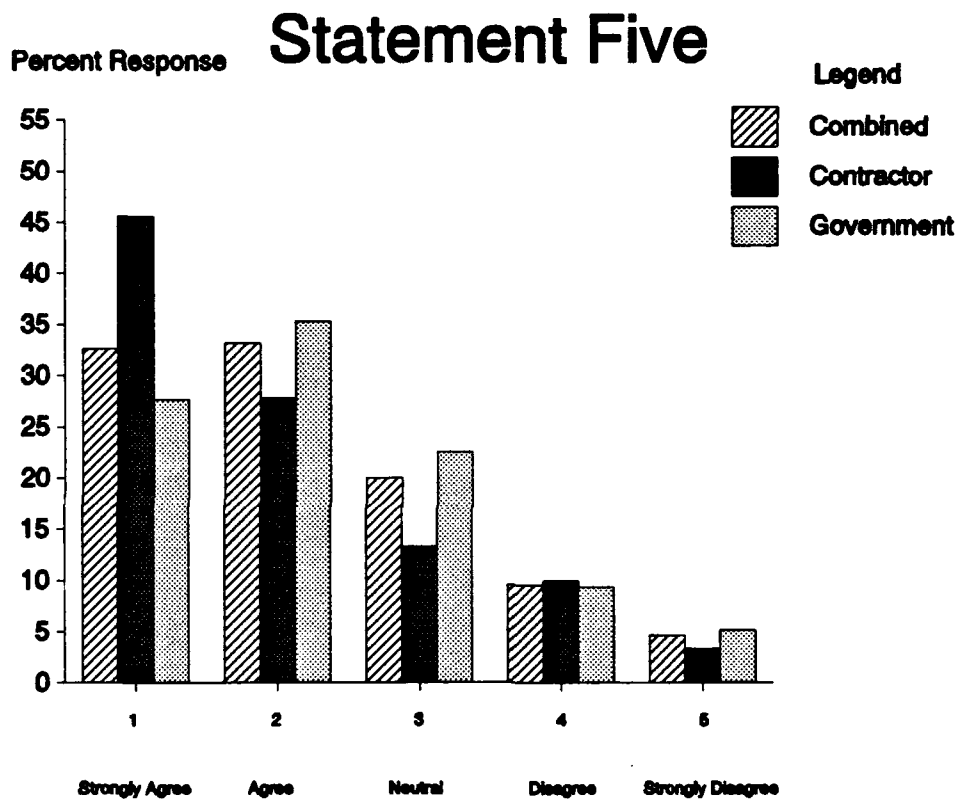


Figure 5 Statement number five.

b. Contractor Responses

Some typical comments received that are indicative of the majority of responses are provided below:

We now bring the Government representatives in our meeting to help solve problems.

During process mapping, communication occurs to enhance the process.

Our communications are wide open in a pro-active fashion. We are together on problem identification and resolution.

At all levels people are working as teams to better the product not just send memos back and forth.

DCMC attends twice/week Assembly Corrective Action Board (ACAB) meetings chaired by production.

I feel there is more of an attitude of cooperative effort to define and prevent problems.

Under IQUE, we have a sense of openness with our Government counterparts. Instead of hiding problems, we are able to share them, correct them and learn from them.

6. Statement Six; The Change To IQUE Was An Improvement In The Method Of Ensuring Conforming Products.

The intent of this statement is to solicit an opinion of the need for a change in the quality assurance system when the primary objective (ensure acceptance of conforming products) remains the same. The results of the survey expressed as a percentage of respondents are provided as Table VI and translated into Figure 6 to provide visual reference.

TABLE VI RATINGS AS A PERCENT OF TOTAL RESPONSE.

Rating	1	2	3	4	5
Combined	23.69%	31.69%	22.46%	11.69%	10.46%
Contractor	28.42%	29.47%	28.42%	6.32%	7.37%
Government	21.74%	32.61%	20.00%	13.91%	11.74%

a. Government Responses

Some typical comments received that are indicative of the majority of responses are provided below:

It allows the QAR to be his own manager. Who else is more qualified to decide how to perform at a contractor's facility then the QAR assigned there.

Its a system that allows teamwork between the Government and private industry.

It has always (in past) been dictated by management all the steps to be taken at plant level which meant we were spending time on processes that did not need "fixing". Now QAR concentrates on problems only.

CQAP just kept the QAR/QAS locked into the same groove. Whereas, IQUE lets you flex, spend time where the problem areas are and talk about it with the people who own that process and through this effort resolve the problem and improve the item.

The concept of process control adds an increase in quality conformance in all areas of manufacturing.

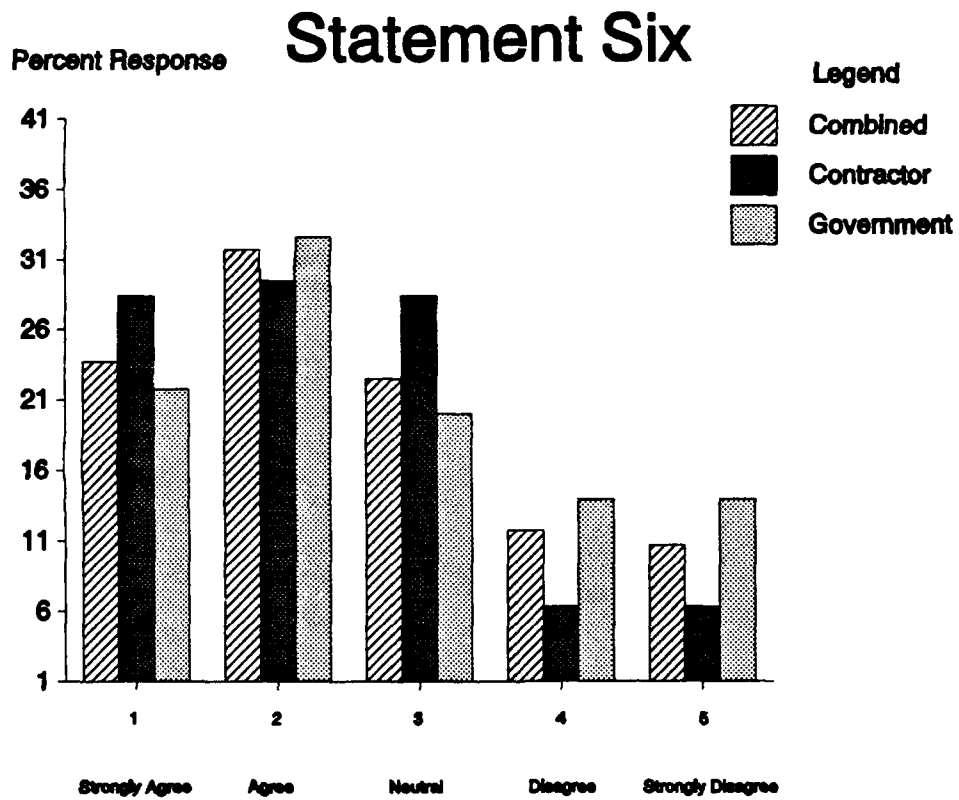


Figure 6 Statement number six.

Established efficient problem solving with parieto, run charts and histograms directs us toward improving the method of ensuring conforming products.

IQUE is definitely an improvement over all manufacturing methods, but more so in repetitive manufacturing.

I agree, however, I feel the way it was implemented, was not done smoothly and slowly enough to ensure continuity and uniformity.

IQUE incorporates the proactive approach to quality assurance. This is a vast improvement over the old, after the fact, police actions.

b. Contractor Responses

Some typical comments received that are indicative of the majority of responses are provided below:

IQUE seeks out the areas of agreement & builds upon them as opposed to trying to "catch" the contractor doing something wrong

We relied too heavily on finding defective goods at the end of the manufacturing process. We are now attempting to learn how to manage the components of manufacturing to reduce defects in the line.

Has helped our company initiate a SPC program.

Through working together, DCMAO and the contractor have better identified problems/possible problems prior to shipment of hardware.

7. Statement Seven; Government Oversight Has Decreased As A Result Of IQUE.

The intent of this statement is to solicit an opinion on the withdrawal of Government oversight as the result of

selfgoverning by contractors. The results of the survey expressed as a percentage of respondents are provided as Table VII and translated into Figure 7 to provide visual reference.

TABLE VII RATINGS AS A PERCENT OF TOTAL RESPONSE.

Rating	1	2	3	4	5
Combined	11.69%	23.38%	29.85%	22.15%	12.92%
Contractor	17.02%	20.21%	36.17%	17.02%	9.57%
Government	9.52%	24.68%	27.27%	24.24%	14.29%

a. Government Responses

Some typical comments received that are indicative of the majority of responses are provided below:

Not on contracts that I've been aware of.

I don't feel oversight has decreased, but it has become more effective. We now have the latitude to decrease oversight effort in areas where the contractor exhibits adequate control and concentrate our effort in specific areas identified via data analysis as problematic.

Most of my work still consists of PCO imposed mandatory [requirements].

We have not been in this program long enough to generate the confidence necessary to completely "back out" of any given area or process.

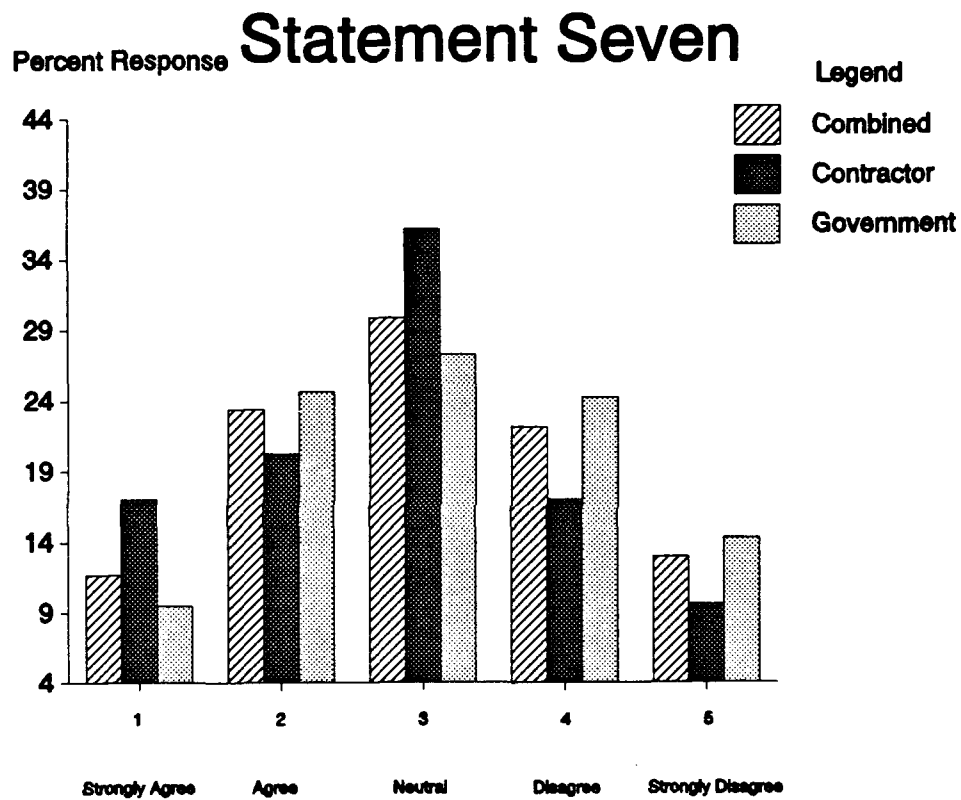


Figure 7 Statement number seven.

b. Contractor Responses

Some typical comments received that are indicative of the majority of responses are provided below:

Areas of oversight and emphasis have changed.

Our Government QAR occasionally accepts her in-process data to sign off on product.

I don't think this is a measurable item.

Not yet: but as we improve and develop confidence in each other this will surely be an added benefit of IQUE.

Government oversight at this facility has not been reduced with the exception that on one program, where we are doing SPC and providing the DCMC QAR with SPC data, we no longer have to submit this product for final inspection to the Government.

Haven't experienced any oversight in the past.

Appears to be little change from previous QARs.

Don't understand.

8. Statement Eight; IQUE Has Fostered A "Good News" Or Teamwork Approach To Management Vice The Dictatorial Approach.

The intent of this statement is to solicit an opinion of the management system currently in use. The results of the survey expressed as a percentage of respondents are provided as Table VIII and translated into Figure 8 to provide visual reference.

TABLE VIII RATINGS AS A PERCENT OF TOTAL RESPONSE.

Rating	1	2	3	4	5
Combined	18.58%	32.20%	28.48%	8.67%	12.07%
Contractor	24.21%	30.53%	31.58%	5.26%	8.42%
Government	16.23%	32.89%	27.19%	10.09%	13.60%

a. Government Responses

Some typical comments received that are indicative of the majority of responses are provided below:

The teamwork approach works because of the IQUE concept of discussing the problem with the responsible element and the use of CIOs.

The Government is actually performing an in-house audit for the contractor. Why shouldn't they be happy. Contractor does not pay for this service.

This is true, philosophy change away from a negative has improved working "attitude."

The IQUE program is a refreshing change from the dictatorial approach. The teamwork fostered by the program truly concentrates all efforts on problem solution rather than useless power struggles.

Contractor more apt to discuss problems with Government because the fears of being "beat up" by the Government have diminished.

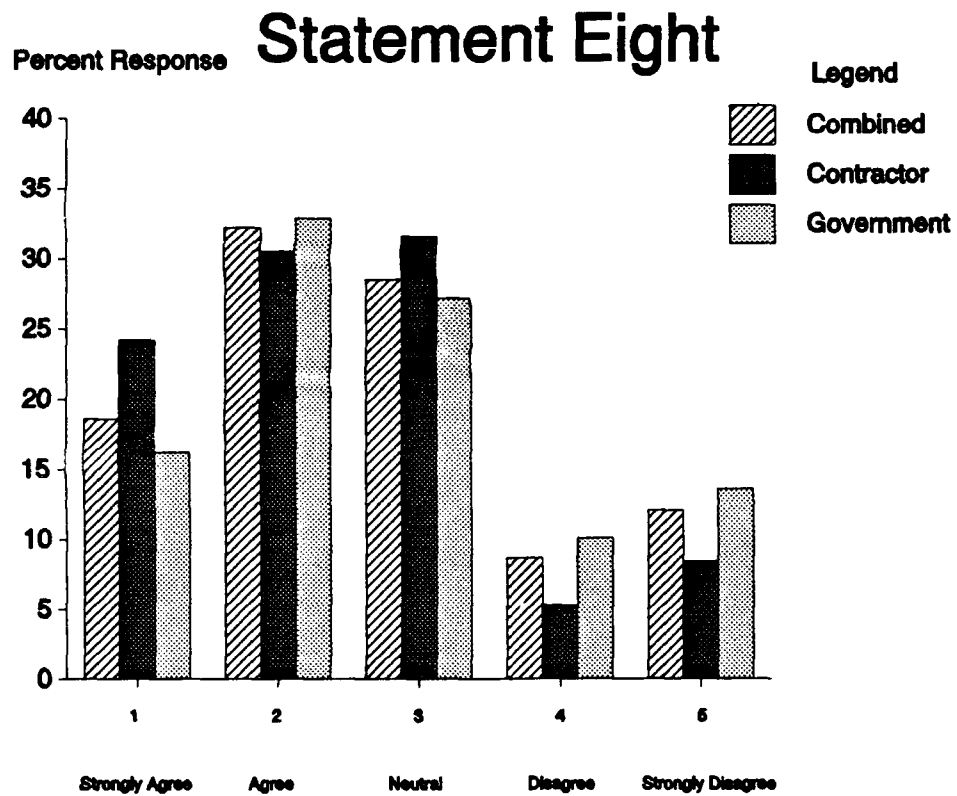


Figure 8 Statement number eight.

Teamwork is definitely the new trend. Cooperation appears to be the wave of the future. As a QAR I strongly feel I am in control of my contractors and can interface freely with other Government agencies.

I believe that industry has been surprised by the results of this effort, making it a viable program as opposed to just words.

b. Contractor Responses

Some typical comments received that are indicative of the majority of responses are provided below:

The teamwork approach is improving but needs the support at the Command level.

Easier to discuss production issues and what is being done about them.

That's wishful thinking on both sides.

Probably is highly dependent upon the interpersonal skills of the QAR.

From a contractor's perspective, IQ does not "foster" an approach to management. It certainly has changed the way issues concerning the Government are managed - towards a cooperative/teamwork strategy.

Generally this is true. Q-Tips (especially 3-5 year old ones) bring back this dictatorship.

9. Statement Nine; IQUE Has Reduced Inspections.

The intent of this statement is to solicit an opinion as to whether IQUE has led the move towards self-governing, and away from Government inspection. The results of the survey

expressed as a percentage of respondents are provided as Table IX and translated into Figure 9 to provide visual reference.

TABLE IX RATINGS AS A PERCENT OF TOTAL RESPONSE.

Rating	1	2	3	4	5
Combined	17.96%	31.58%	24.46%	15.17%	10.84%
Contractor	19.79%	21.88%	25.00%	21.88%	11.46%
Government	17.18%	35.68%	24.23%	12.33%	10.57%

a. Government Responses

Some typical comments received that are indicative of the majority of responses are provided below:

I have found that inspections of product are being encouraged by the contractor as he tries to absorb a second opinion during final. I like this because it enhances teamwork. IQUE audits are also increased inspections.

Under CQAP we had to look at certain things every 30 days, every 60 days, twice a week, etc. IQUE allows you the freedom to adjust frequency according to circumstances.

QAR has flexibility in sampling plus the option to select audit points and if justified eliminate audits in select areas.

In the long run, yes. Inspections (product audits) actually increased initially until confidence in the product was established.

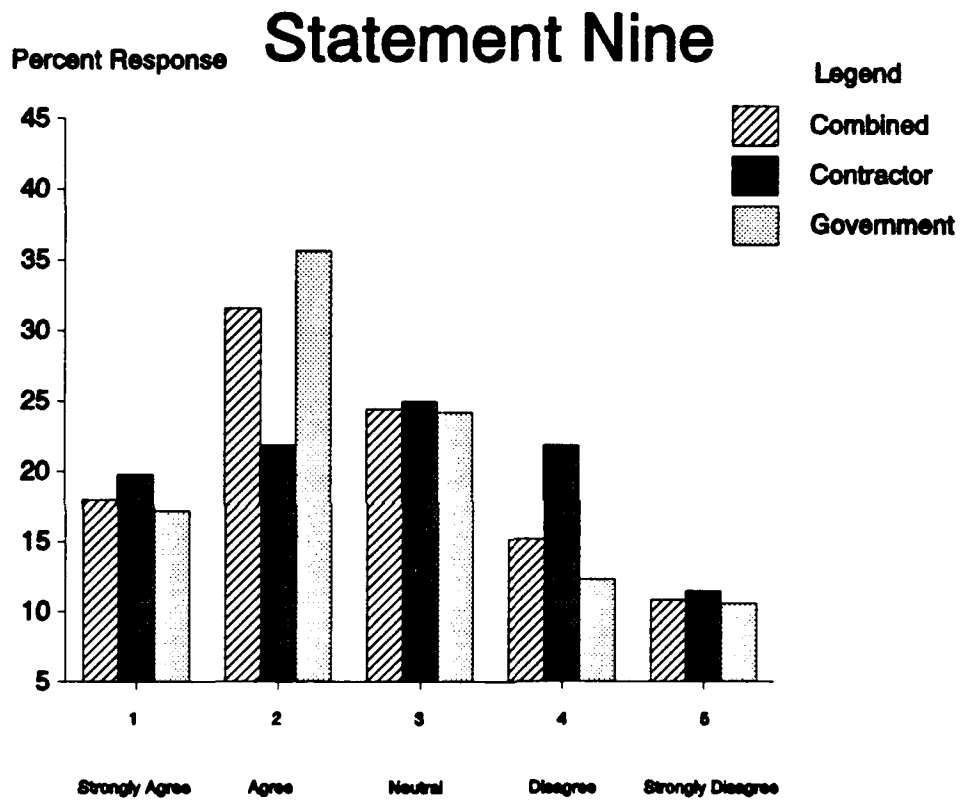


Figure 9 Statement number nine.

In most cases, but the Navy & Supervisor of shipbuilders under their Level I/Subsafe [program] still want & delegate mandatory inspections to an unacceptable level. With no other reason than "it's just that way."

IQUE has reduced final inspections but processes audits & product audits have replaced large number of final inspection item.

Not in small contractors, but significant decrease in major contractors due to insufficient staffing to implement IQUE and maintain same level of inspection.

The old system had so many mandatory inspections and audits that were not needed. I can now concentrate on areas that have change or problems occurring.

Process proofing and product audits, provide good indication for less inspections of final product.

If you have a very reliable contractor, inspections will be reduced. Until this is proved, you have product audits & process audits (Government does not like to use the word inspection any more).

b. Contractor Responses

Some typical comments received that are indicative of the majority of responses are provided below:

Inspections will be reduced due to IQUE in my opinion. However, it has not happened at our company yet.

Our company is still performing the inspections for the data but Government has reduced many in process inspections.

Don't see any change.

Reduced by "inspectors", but better verification of product by operators, machinists, & mechanics.

10. Statement Ten; I Received Sufficient Training In The IQUE Program.

The intent of this statement is to solicit an opinion on the adequacy of the implementation training. The results of the survey expressed as a percentage of respondents are provided as Table X and translated into Figure 10 to provide visual reference.

TABLE X RATINGS AS A PERCENT OF TOTAL RESPONSE.

Rating	1	2	3	4	5
Combined	13.98%	23.60%	26.71%	19.25%	16.46
Contractor	14.74%	21.05%	34.74%	13.68%	15.79%
Government	13.66%	24.67%	23.35%	21.59%	16.74%

a. Government Responses

Some typical comments received that are indicative of the majority of responses are provided below:

Only at the start of the program. In the last 1 1/2 years, I have heard nothing from my supervisor.

Additional training in what data should be gathered and what to do with the gathered data, is needed.

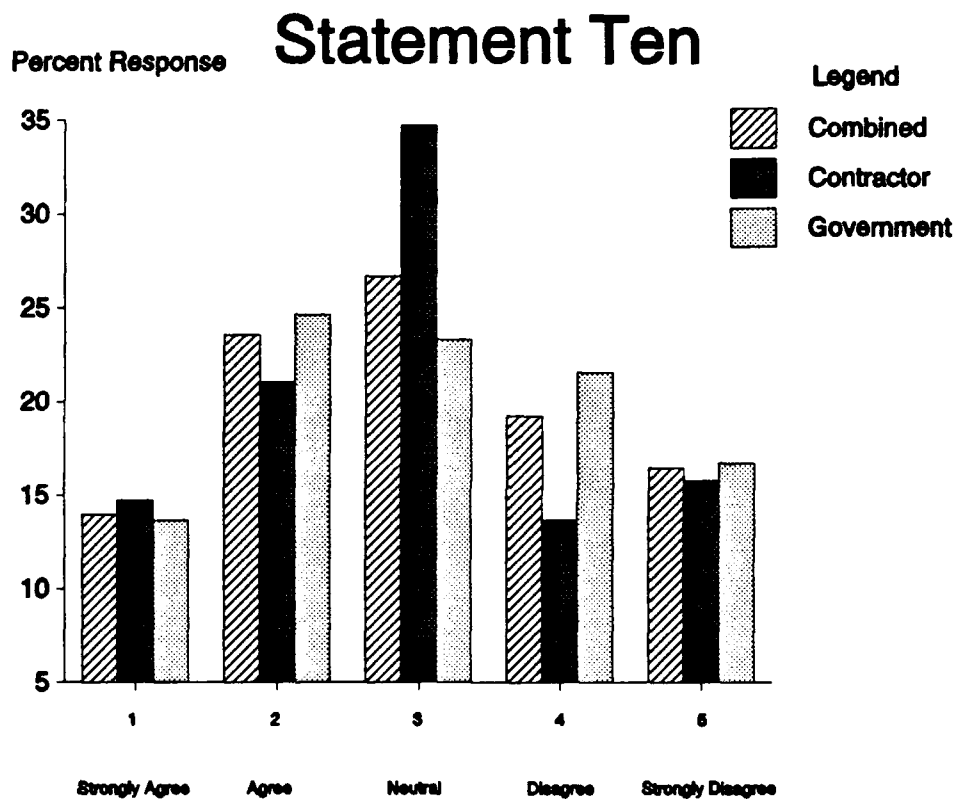


Figure 10 Statement number ten.

S.P.C. & IQUE training was adequate, but the various commodities require different approaches. Usually the instructions given, were examples to a machine environment, automatic manufacturing. I feel it would be useful if primary training could be commodified.

The training was very informative. Again, the contractor is the only one that can effectively run an SPC program and it needs to be contractually specified.

IQUE is more a state of mind. Tasks have different names but are the same thing. Charts are the only real new item.

I feel that the organization became over zealous to get into IQUE, causing a tremendous amount of confusion to the QARs as to what those in the know really wanted.

We need the requirements defined! Too many chiefs with their own ideas!! District and AO need to tell us what they want!!

Needed more training than the five day mandatory class.

Since this is relatively new it's kind of like the blind leading the blind. No one with enough experience in the program has been available. On the surface it looks easy but actually doing the job is a lot harder.

Training was adequate. Refresher will be needed. Still have supervisors who feel threatened and unwilling to give QAR latitude to utilize IQUE properly.

b. Contractor Responses

Some typical comments received that are indicative of the majority of responses are provided below:

More training would be advantageous.

I think we were skeptical at first because we only had one short briefing. A couple of additional sessions would have helped if spaced properly.

No specific training from the Government was provided other than an explanation of the program.

Second hand data only, joint training Government & company might help.

The meeting attended by the main office appeared very adversarial.

IQUE training was held by the Government in the form of two seminars. Additional training will be ongoing.

11. Statement Eleven; The Number Of Product Quality Difeciency Reports (PQDRs) Received/Processed Has Decreased.

The intent of this statement is to solicit an opinion on the number of PQDRs that have been received or processed. The PQDR is a measure of the level of quality at a specific facility and would be expected to show a reduction if the policies of IQUE were effective. The results of the survey expressed as a percentage of respondents are provided as Table XI and translated into Figure 11 to provide visual reference.

TABLE XI RATINGS AS A PERCENT OF TOTAL RESPONSE.

Rating	1	2	3	4	5
Combined	12.69%	16.10%	49.23%	8.98%	13.00%
Contractor	27.37%	29.47%	35.79%	2.11%	5.26%
Government	6.58%	10.53%	54.82%	11.84%	16.23%

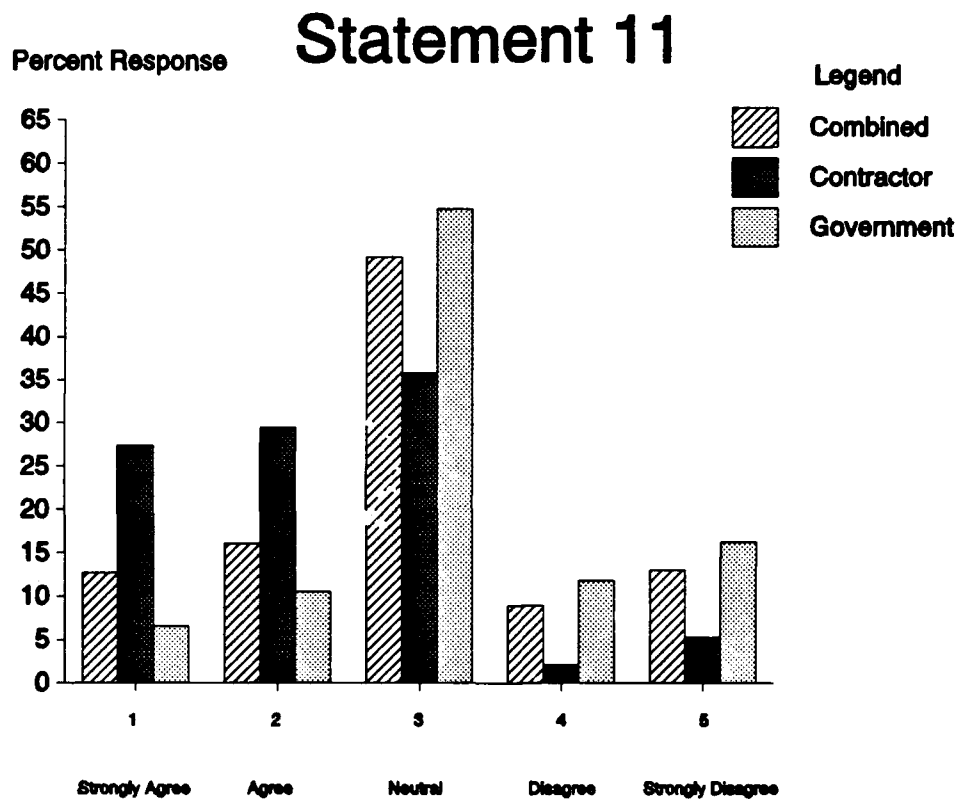


Figure 11 Statement number eleven.

a. Government Responses

Some typical comments received that are indicative of the majority of responses are provided below:

At this juncture we have noticed no real difference in PQDRs.

We see PQDRs months or even years after we ship so it's really too soon to tell.

That is hard to say as we did not receive many in the first place.

I doubt it, because our IQUE program is still too young & we don't have accurate measuring devices to determine if IQUE has had a true impact on items.

b. Contractor Responses

Some typical comments received that are indicative of the majority of responses are provided below:

Too soon to tell.

Customer initiated PQDRs have remained constant.

**12. Statement Twelve; More Corrective Actions Are Handled
On A Verbal Basis Under IQUE.**

The intent of this statement is to solicit an opinion as to the effectiveness of verbal rather than written corrective actions. The results of the survey expressed as a percentage of respondents are provided as Table XII and translated into Figure 12 to provide visual reference.

TABLE XII RATINGS AS A PERCENT OF TOTAL RESPONSE.

Rating	1	2	3	4	5
Combined	39.94%	35.85%	12.89%	6.29%	5.03%
Contractor	31.18%	34.41%	16.13%	9.68%	8.60%
Government	43.56%	36.44%	11.56%	4.89%	3.56%

a. Government Responses

Some typical comments received that are indicative of the majority of responses are provided below:

In the spirit of IQUE QARs are going direct to the source with QA and verbally requesting corrective action.

Contractors show more cooperation when most corrective actions are verbal.

I work on the "strike one, two, three you're out theory." Only once in two years have I gotten to three.

I have not written a Corrective Action Report since IQUE was implemented. Under CQAP a defect found while performing a Product Evaluation mandated a written QDR.

Went from 5% method A to 95% verbal.

Almost all corrective action is handled on a verbal basis as long as a cooperation continues.

We were in a pilot facility (6-89 start IQUE) and have issued less than five written CARS since then.

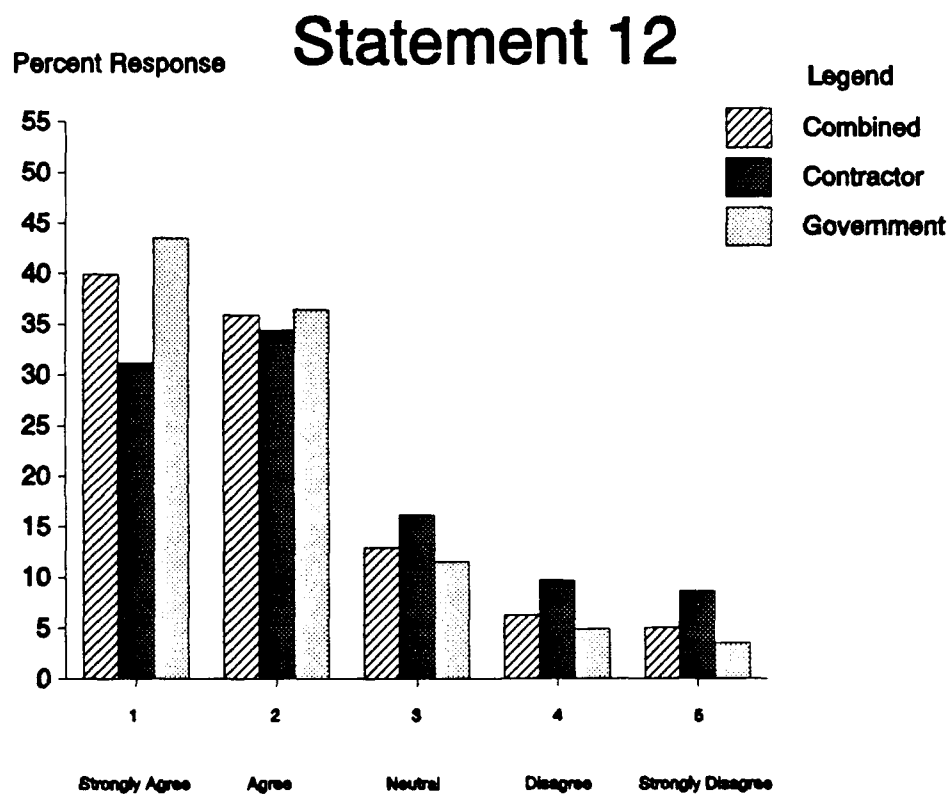


Figure 12 Statement number twelve.

Corrective action requests that are addressed verbally, tend to be less threatening and contractors approach them with curiosity rather than a mandate.

Previous policy limited verbal corrective action requests to instances where corrective action could be taken immediately; IQUE emphasizes verbal requests in most cases.

While written CA provides a record usable in court, it alienates its receiver. Responding in writing only complicates things. We extend trust with a verbal CA and 90% of the time the trust is returned with correction and good feelings.

Due to the improved spirit of cooperation, contractor personnel react more favorably to verbal actions than they did in the past.

The contractor recognizes the benefit from not having to respond to CA in writing. Therefore, they are responsive to verbal requests.

b. Contractor Responses

Some typical comments received that are indicative of the majority of responses are provided below:

The fact that a "verbal" corrective action has taken the place of the method B, C/A has little influence. QAR still requires written response and tally the number of "verbals" issued.

Many random on the spot corrective actions are agreed to under IQUE which under the old system were put in writing requiring a written response.

Verbal corrective actions are less of a threat. They make it easier to work together and be more open.

IQUE will be less formal than old ways which will foster the teamwork attitude.

Simple problems can be resolved by Government or company representatives discussing problems with operators to find root cause. This "open minded" approach works better by building trust and teamwork.

13. Statement Thirteen; IQUE Has Increased Customer Satisfaction.

The intent of this statement is to solicit an opinion of the success in obtaining the first stated goal of the IQUE program. The results of the survey expressed as a percentage of respondents are provided as Table XIII and translated into Figure 13 to provide visual reference.

TABLE XIII RATINGS AS A PERCENT OF TOTAL RESPONSE.

Rating	1	2	3	4	5
Combined	7.83%	17.92%	55.66%	9.12%	9.43%
Contractor	9.78%	27.17%	50.00%	7.61%	5.43%
Government	7.08%	14.16%	57.96%	9.73%	11.06%

a. Government Responses

Some typical comments received that are indicative of the majority of responses are provided below:

Results are yet to come.

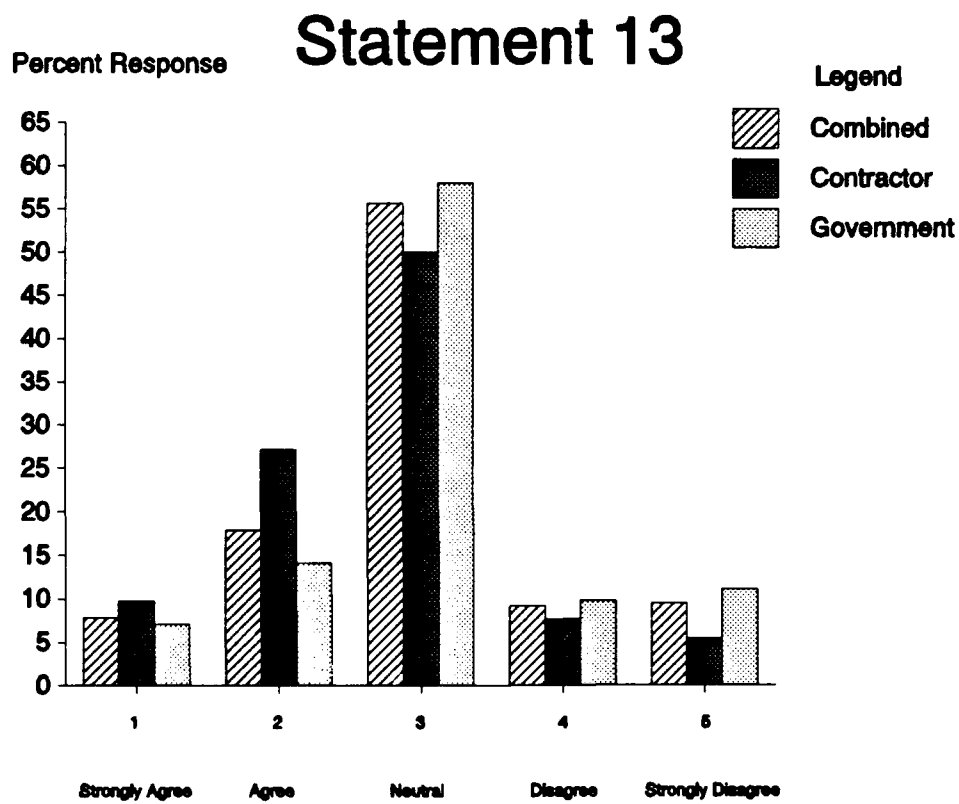


Figure 13 Statement number thirteen.

Although communication is recommended, to date we have not had significant discussion with customers to determine their end item quality changes.

I have not received any information regarding customer satisfaction. My conversations with procuring personnel, found that they are not aware of the IQUE program.

I can not identify any specific instances of increased customer satisfaction.

We have no feedback in either direction. We hope it has.

It is too early to tell at this time, unless you receive PQDRs from the field activities.

I don't feel that enough products have gotten into the field, that were produced under IQUE concepts to make a proper determination of customer satisfaction.

Time will tell. We do have more information for the customer now, if he wants it.

b. Contractor Responses

Some typical comments received that are indicative of the majority of responses are provided below:

The customer will feel as if he has been involved in the manufacture of the item and will have a better confidence in the product. When the customer is confident in the quality of the product, customer satisfaction increases.

I'm not sure there has been enough time for flow-down and/or a yardstick to measure with.

No change detectable.

Not sure we have a grasp or can measure any changes in customer satisfaction as a result of IQUE.

C. SUMMARY

The results of a questionnaire designed to solicit opinions from quality assurance personnel, from both Government and industry, on the IQUE program and the extent to which its goals have been accomplished were presented in this chapter. The data presented represent the opinions of the majority. Additional minority opinions were considered in the analysis of the responses to the questionnaire presented in the following chapter.

IV. DATA ANALYSIS AND INTERPRETATION

A. INTRODUCTION

This chapter presents an overall analysis of the data presented in Chapter III and provides a basis for the conclusions presented in Chapter V.

B. GENERAL ANALYSIS

The results presented in Chapter III are analyzed using a technique that compares the difference between responses that agreed with the given statement and those that disagreed with the statement. The total percentage of agreement and the total percentage of disagreement were used in determining a value for the differential.

The analysis of the differentials was performed by two distinct demographic categories consisting of Government response and contractor response. A differential value was determined by subtracting the percentage of respondents that disagreed with a statement from the percentage that agreed with the statement. By plotting the differential value for each statement against the statement number, a matrix was developed that was used to determine groupings of responses.

Table XIV presents a visual representation of the results of the Government response differential analysis. The statement response differential values are expressed as a

Table XIV Government Differential

	1	2	3	4	5	6	7	8	9	10	11	12	13
70												X	
65													
60													
55			X										
50													
45					X								
40													
35													
30													
25						X		X	X				
20													
15													
10													
5				X									
0							X			X			X
-5	X												
-10											X		
-15													
-20		X											

range of five percentage points. As an example the zero represents a differential value of from zero to five percent and the 30 represents a differential value from 30 to 35 percent. Table XV presents a visual representation of the results of the contractor response differential analysis. A visual analysis of Table XIV and Table XV was used to determine response groupings. The results of the differential analysis of response data and response percentages are presented as Appendix B.

The results of the analysis presented above also separated into three distinct areas of responses. These three areas are as follows:

1. Responses considered to be positive statements.
2. Responses considered to be neutral statements.
3. Responses that differed, dependent upon the demographic group.

1. Positive Statements

The positive statements, or those that had responses that agreed with the statement, were defined as those statements that have a differential value above the 20 to 25 percent range based upon the above analysis, and were the following statements:

3. IQUE has improved the relationship between the Government and industry.

Table XV Contractor Differential

	1	2	3	4	5	6	7	8	9	10	11	12	13
70													
65													
60			X		X								
55													
50													
45											X	X	
40						X		X					
35													
30													
25				X									
20													X
15	X												
10		X					X						
5									X	X			
0													
-5													
-10													
-15													
-20													

5. IQUE has fostered the spirit of teamwork between the Government and Industry.

6. The change to IQUE was an improvement in the method of ensuring conforming products.

8. IQUE has fostered a "good news" or teamwork approach to management vice the dictatorial approach.

12. More corrective actions are handled on a verbal basis under IQUE.

The responses to each of these statements had a differential of at least 25 percent, in the direction of agreement with the statement.

Additionally statements three, five and 12 had differentials that exceeded 40 percent in agreement with the statement. These statement responses are defined as highly positive.

2. Neutral Statements

The statements that were considered neutral, or those that had responses that neither agreed nor disagreed with the statement, are defined as those statements that fall below the 25 to 30 percent range and above the negative 10 to negative 15 percent range. The following statements were determined to be neutral by visual analysis of tables XIV and XV:

1. IQUE has decreased the number of nonconforming products.

7. Government oversight has decreased as a result of IQUE.

10. I received sufficient training in the IQUE program.

13. IQUE has increased customer satisfaction.

Each category of respondent fell between the defined range, with less than a 25 percent differential and greater than negative 15 percent differential, as determined by the analysis described above.

3. Government And Industry Not In Agreement

The response to four of the thirteen statements were neither completely neutral nor completely positive. Each of these four statement responses had one demographic category differ with the other category.

Two statements had a positive industry response while the Government response remained neutral.

Another statement had a positive Government response while the industry response remained neutral.

Only one differential fell below the range of negative ten to negative 15. This single response differential is determined to be a negative response. This negative response had one category of respondent disagree with the statement, while the other category remained neutral.

None of the statements received negative responses from both Government and contractor representatives.

a. Positive Industry Response

Responses for two of the four statements resulted in the industry/ response having the required differential threshold

in the direction of agreement, while the Government remained neutral. Those statements were:

- 4. Product quality has improved as a result of IQUE.
- 11. The number of PQDRs received/processed has decreased.

Both of these statement responses had a contractor response differential greater than the 20 to 25 percent range designated as the threshold.

b. Positive Government Response

Statement number nine, "IQUE has reduced inspections", had a Government differential that provided a response in agreement with the statement while the contractor response remained neutral.

c. Negative Government Response

The only statement that evoked an opinion that was considered to be negative, or towards the disagreement side of the responses, was provided by the Government in the response to statement number two; "IQUE has reduced the cost of products." In this statement the industry response was considered to be neutral.

C. POSITIVE STATEMENTS

The largest concentration of similar answers were related by a positive attitude towards the program. These were the results of four general statements and one statement that was of an operational nature. The responses to statements three,

five, six and eight all had a positive reaction to statements that had an underlying theme of improvement and teamwork. The fact that statement twelve, an operational type of statement, fell into the positive results grouping was, in the researcher's opinion an indication of cause and effect.

The two most significant changes contributable to IQUE that each of the statements had in common and that were reflected in the responses to the positive statements were a change in the attitude between Government and contractor and improved communications.

1. Change In Attitude

The first of the positive changes attributable to IQUE, a change in attitude, is exemplified by the shift away from written reports when quality problems are encountered. The reduction of written corrective action requests have been received by both the Government and by industry as a welcome change to what was considered a rigid system. The ability of the QAR to focus on problem areas, rather than perform required periodic inspections, has led to more cooperation with the contractor. Many QARs reported that contractors are inviting Government representation in contractor quality management meetings because the threat of Government intervention has been reduced. The reduction in the requirements of written corrective action requests have been received as a reduction of the policeman attitude and a

promotion of an attitude of cooperation. Some of the comments from the survey that represent the attitude change were as follows:

Contractor is less intimidated because now Government is not a policeman but an entity to help them with their system implementation.

Frustration & stress level has reduced significantly, less of the "us" vs. "them" syndrome.

With the IQUE program the teamwork concept is very good. Contractors management personnel is very cooperative. We sit down in a civilized manner. Potential problems are discussed and there is mutual respect between the Government and the contractor.

The relationship is no longer adversarial (in most cases) and will continue to improve with time. In my case this has been a very welcome approach by industry. We can work together to obtain the same results, the best quality product for the services.

I feel the "IQUE methodology " and the implementation thereof has been read by the contractors and they see that the Government can change, and work with the contractors.

The old QAP systems were essentially negative oriented. The only time we interfaced with the contractor was to identify problems with their product or quality system. Also, despite contractor effort, those old systems had triggers for C.A. escalation. IQUE is cooperative oriented. It permits acknowledgement of contractor self improvement effort and does not require C.A. escalation if efforts are leading to obvious process improvements.

Yes! Yes! Yes! We are no longer perceived as the adversary.

There is a 100% change in the relationship from two years ago. With nearly thirty years in quality this is the best working team I've seen!

IQUE philosophy has altered the relationship from simple acceptance/rejection of product to one of working together towards a common goal of improving product quality.

There is more of an attitude of cooperation between the QAR and the contractor to correct/prevent problems.

Less adversarial. Relationships are more open. We share information. I am not afraid in revealing a problem that I'm going to spend untold hours writing a report explaining why a system failed or why some one missed something. We spend more time fixing the problem.

2. Improved Communications

The second of the positive changes contributable to IQUE, improved communications, is directly related to the improvement of relations. A portion of the Government respondents felt that the elimination of the restriction of discussing quality problems with other than contractor quality personnel allowed for more efficient problem solving. Representative comments from the survey were as follows:

Better communications with less paperwork. Teamwork concept rather than separate teams.

Government reps sit with management and discuss "Good news" items and work out any problems in common sense, face-to-face open manner.

We currently have weekly reviews with the QAR & plant management, much of which is devoted to improving communications & teamwork.

We have tracked a reduction of written corrective actions and also tracked an increase in verbals. More positive communications has been the result.

IQUE has removed the element of fear from the Government/contractor relationship. Communication and sharing of ideas has improved product quality.

The results that provided an indication of an improvement in the interaction between contractors and Government QARs were validated by an unpublished contractor IQUE survey performed by DCMAO Cleveland. The results of the DCMAO Cleveland survey demonstrated that 76% of the respondents believed that IQUE had provided for improved communications and interactions between the contractor and the QAR since the implementation of the program.

D. NEUTRAL STATEMENTS

The statements that received neutral responses also present what, in the researcher's opinion, was a series of general statements and an operational type statement that was an indication of cause and effect.

Statement numbers one, seven, ten and thirteen received responses that were considered to be neutral or have inconclusive results. These responses are considered inconclusive in that they had a neutral response, that did not allow conclusions about the survey statement to be formulated, other than quality representatives do not agree or disagree with the statement.

1. More Time Required

The most common comment provided with the neutral responses was the opinion that more time was needed before any assessment of IQUE could be performed. A statement that three to five years should elapse before results could be observed

was also repeated. Some of the comments from the survey that represent that position were:

... we have seen a great deal of change in a short time. I think it will take longer than some people might think or desire to implement all aspects of IQUE. Through TQM efforts, one would think that IQUE will change and improve as we gain experience.

This survey is being taken too soon relative to the degree of IQUE implementation at this time. Try again in about five years.

IQUE is a long term program to promote continuous improvement at the contractor's facility. There hasn't been enough time for IQUE to have great impact.

Contractor is just beginning to get on board with SPC data collection. IQUE program is stalled until data is available. The program needs 4-5 years of maturity. Too early to tell.

Although a common response, the "wait and see" response seems out of place when the type of statement that received a neutral response is reviewed. The number of nonconformances and the level of both Government oversight and customer satisfaction is at least observable, if not measurable. The belief that a period of from three to five years was required before an accurate evaluation of the IQUE program could be preformed was, in the researcher's opinion, the most significant reason for the neutral responses to survey statements.

2. Sufficiency Of Training

The neutral response to statement number ten on the sufficiency of training also implied neutrality on the quality of the training. Several of the written opinions, although not in the majority response category, indicated a lacking in the quality of program training.

The training was not consistent. Each instructor had his own ideas about the interpretation and implementation.

We may have been properly trained in the IQUE philosophy, but for the QAR to be able to implement that philosophy more efficiently, we need to know a lot more about how to use certain tools. For example, we need much more experience and training with statistical process control. We were given computers with no plan on how to use them, and little training.

I feel our training program and instructors are of a high caliber and have done a good job, but training should be ongoing and not a one time deal.

The IQUE course taught as directed by DLA was really bad. Very little was learned about developing IQUE plans, how to proof processes and document proofing, and in general what IQUE was all about.

Statement ten is the statement that the researcher considered to be an indication of at least a portion of the cause for this group of statements neutrality. An uncertainty about what was expected of Government QARs permeated the responses to the statement on training. In the opinion of many quality personnel an uncertainty of procedures, supervisory guidance and the lack of accurate measuring devices to

determine the "value added" of the program have all been unanswered by training. These unanswered questions are, in the researcher's opinion, another reason for the neutral responses received to survey statements.

3. Measurement Standards

The final reason for the neutral response to survey statements is reflected by a concern for the lack of program standards of measurement. The program has been implemented on a universal basis regardless of the type of manufacturer, type of commodity or the type of contract. Each of these areas evoked concern from the respondents about the ability of the program to measure what is a better value to the Government of providing for nonconforming products. The concern centered around a perceived inflexibility in implementing the program when specific circumstances, such as low production quantities, not considered to be conducive to IQUE are involved. Some of the comments that reflect this concern follow:

We do not yet have a national goal/direction/method(s) of measuring the "value added" implementation of this program. I don't see us having invested in a unified formal "intern" program that would provide a true grassroots implementation of a theoretically sound program.

IQUE stresses statistical means to assess product quality. This is all well and good when the data are available, the processes are stable and the production quantities are sufficient. But it all falls apart when the contractor is unable or unwilling to cooperate, the production quantities are one or two per month or the processes are only done on an infrequent basis or they are changing.

I believe that management felt that innovation by the QAR in his facilities would satisfy IQUE implementation. You can not rely on innovation alone. The need for purpose, commitment and direction from management is necessary for implementation and relentless improvement of the IQUE program.

Each product commodity is different and each requires a different approach. Please, no blanket solutions. Can be effective tools, but in other areas serve no purpose other than wasting time.

IQUE may not provide the best value on certain commodities like clothing and textiles due to high amount of labor required and very low bidding prices.

E. GOVERNMENT AND INDUSTRY NOT IN AGREEMENT

1. Industry Agreement With The Statement

This category of response was characterized by Government retaining a neutral response and industry agreeing with the statement. One of the statements (statement number four) dealt with the product quality improvement while the other (statement number 11) dealt with the decrease in the main indicator of defective product (PQDR) flowing through inspection. The responses provided by industry were not only consistent, they were typical of most of the responses, in that industry provided a stronger or more positive response

than did the Government. The following survey comments are indicative of the positive response:

Defect rates reduced as part of SPC plan. DCMC part of team reviewing data and corrective actions.

Over the past two years our yield have continued to improve.

Better control of processes allows more standardization of the product.

As recently as yesterday I participated in a joint review of an assembly process with poor design for manufacture.

In a few hours we had together brain stormed some simple changes that will improve yield and quality greatly.

Product quality and process integrity have stabilized at a higher level through the problem solving approach.

The end users remark how much improved the quality is on our product. We expect to see higher customer satisfaction levels in the future because of planned improvements.

The DCMAO Cleveland survey also had a question that queried the contractors as to the improvement of product quality as a direct result of IQUE. The results indicated that only one third of the respondents could provide any evidence of improved product quality.

2. Government Agreement With the Statement

Statement number nine, "IQUE has reduced inspections", received a positive from the Government. The neutral response on the part of the contractor representatives could be

explained by the difference in the definition of "inspection" that has developed with the implementation of IQUE. As explained rather succinctly by several questionnaire responses, the Government QAR is now unwilling to use the word "inspection", and uses terms like process audit, product audit, process proofing and verification by process/audit monitoring. The contractor QAR still sees any type of Government oversight as an inspection.

3. Government Disagreement With the Statement

The statement number two, "IQUE has reduced the cost of products.", was the only statement to receive a disagreeing or negative response. The response from contractors remained neutral while the Government provided a negative response. Although this was not a strong response on the negative side, it represents over 38% of the Government respondents. The negative response on the part of the Government was overwhelmingly explained by the comments provided in response to the survey statement. The Government contention was that an initial increase in costs, due to the cost of starting SPC, would be overcome in the future when IQUE has had enough time to become effective and the cost of rework has been reduced. Using the written responses in conjunction with the numerical rating the researcher considered the response to statement number two to be a neutral response along with the responses to statement numbers one, seven, ten and thirteen.

The results of the DCMAO Cleveland survey confirmed the analysis in that only one third of the respondents to the DCMAO Cleveland survey provided any evidence that IQUE had reduced costs.

F. SUMMARY

This Chapter has presented an analysis of the data presented in Chapter III and provided a basis for the conclusions presented in the next Chapter. The next Chapter presents conclusions from the data analysis, recommendations for improvement of the program and answers to the research questions along with areas for further research.

V. CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION

This chapter presents the conclusions of the research, recommendations for improvement based upon the research, answers to the research questions and suggests areas for further research.

B. CONCLUSIONS

1. The Attitude Of The Government Has Improved

Improved communications and cooperation between contractors and Government QARs have developed into a combination that is responsible for breaking down the barrier of an adversarial relationship created by the prior quality assurance program. This improvement is directly attributable to spirit of teamwork provided by the IQUE program. As discussed in Chapter II, this cooperation could be criticized as doing the contractor's job and was addressed by one QAR as:

IQUE has greatly increased the Government quality paperwork load. Generally the results have not changed as far as the product goes. Now the Government does the contractor's work for him.

The research showed this to be a minority attitude and that the majority of respondents were of the opinion that the program fostered a teamwork approach to quality assurance.

The freedom provided to the QAR by IQUE, to control the quality program and tailor it to the specific needs, was identified by several QARs as the biggest advantage of the program. The QAR can now spend the required time investigating known problems and formulating solutions within known process parameters. The judgment allowed the QAR, or as expressed by several respondents, "common sense approach", has been demonstrated by the complete acceptance of the increase in verbal corrective actions rather than written actions requiring written response.

The ability of the QAR to provide suggestions in the form of Continuous Improvement Opportunities has been received by contractors with great enthusiasm. Many contractors reported inviting the QAR's participation in company meetings to provide another perspective on problem solving.

Simple actions, such as allowing the QAR to talk directly with manufacturing personnel, use more verbal rather than written Corrective Action Requests, and provide suggestions to contractors, have been the mainstay of the IQUE program. These actions have removed much of the fear and anxiety experienced by the contractor and are the basis for the changing attitude that the Government has developed in respect to acceptance of conforming products.

2. The Goals of IQUE Have Not Been Attained

The program intent is to reduce the amount of defective or nonconforming parts received into stock systems. This intent is in line with the primary objective (ensure acceptance of conforming products), provides flexibility, and is favored by industry. It is the researcher's opinion however, that the goals have not been sufficiently addressed to provide for the assessment of any cost, satisfaction level or quality improvement issue involved with this objective. This lack of focus on the program goals is what, in the researcher's opinion, is the cause of the overall neutral response to the questionnaire statements. As indicated by the differential analysis in Chapter IV, the contractor, who has the least input to the implementation of the program, was more agreeable to the goal statements. This, in the researcher's opinion, is an indication that the implementation of IQUE needs to be reemphasized and revitalized on the part of the Government's participation if the system failure that was described in Chapter II is to be prevented under the IQUE program. To achieve the program goals, each participant must not only know the goal but they must understand the full meaning of the goal. Many of the Government respondents indicated that they never heard from their customers or that they did not know who the customers were.

The reduction in cost goal has been demonstrated by the research effort to be the only statement that invoked a negative response. This negative response is an indication that a significant portion of the respondents think that a program whose intent was to decrease costs, in fact initially increased those costs and cost reduction in the future is speculative.

The focus of IQUE has been accomplished in part in that the spirit of teamwork has been improved but the ability to measure has not been addressed sufficiently to allow for the definition of goal attainment.

3. Verbal Corrective Action Requests are an Improvement

The ability for a Government QAR to issue a verbal rather than a written CAR has been seen by both Government and contractor personnel as the impetus for the positive aspects of IQUE. The verbal action allows for a quicker, more flexible response on the part of the contractor and provides for a reduction in the amount of required paperwork. Simple problems no longer require formal action on the part of quality personnel when problems can be resolved at the source. The reduction in the number of personnel involved with a simple problem solution, along with the possibility of an "on the spot" resolution without any paperwork, improves productivity for both the personnel concerned and for the quality

personnel, who do not have to get involved with every minor problem encountered.

4. IQUE Implementation Training Was Not Adequate

The data provided in response to statement ten, "I received sufficient training in the IQUE program.", were considered to be neutral during the analysis provided by chapter four. Within this neutral response is the implication that the training received was less than adequate in some areas of operation. The comments from Government reveal a nonstandard approach to the training from DCMAO to DCMAO. The change to any new program can have transitional problems, however the IQUE implementation left the impression with many quality personnel that very little of the local policy had been thought out prior to actual implementation by the DCMAOs. Repeated comments about the changing reporting requirements leads the researcher to believe that implementation guidance was minimal.

For the contractor, training was only a briefing of the program with individual expectations left to be explained by the Government QAR. This combined with the industry concern that QARs may have little or no experience with the manufacturing processes that they are required to review, provides for a level of uncertainty about the program that may be unwarranted on the part of the contractor.

C. RECOMMENDATIONS

1. Implement a Customer Feedback System

The Defense Contract Management Command should implement a customer feedback system that would improve the customer awareness of the QAR. If the field level personnel do not know who the customer is, achieving a goal of customer satisfaction is impossible. Establishing a path of communication, other than the deficiency report, would provide a direct method for resolution of quality assurance related disputes. A simple approach such as placing the identity and address of the QAR on accepted products could provide an alternative approach to addressing customer concerns.

2. Provide Continuous Training in IQUE

A continuous program of training would reduce any uncertainties and standardize the expectations of all concerned. The establishment of an "IQUE Intern" program, open to both Government and industry, would provide for program continuity and an avenue for addressing industry concerns. Providing training to the contractor that was prepared at the DCMAO level would help resolve concerns about differing expectations.

3. Provide Measurement Standards

Provide standards of measurement that goals can be compared with to provide a measure of accomplishment. The focus of IQUE was demonstrated in Chapter II to involve the

measurement and analysis of processes. The lack of standards with which to measure the success of such a program is contradictory to the intent of IQUE as well as the movement toward contractor self-governance provided by the Exemplary Facilities concept. This would avoid an "improvement at all cost" interpretation of IQUE and would provide a reference point for disengagement with the contractor.

D. ANSWERS TO THE RESEARCH QUESTIONS

The primary research question posed by this study was:
To what extent has the In-Plant Quality Evaluation program attained its goals?

In the opinion of the quality assurance personnel surveyed, the In-Plant Quality Evaluation program has not effectively attained its goals.

The first of the three goals, achieve customer satisfaction, has not been effectively attained. The research has demonstrated that the Government QAR is not aware of the customer's satisfaction level, nor is the QAR aware of the exact customer in many cases.

The attainment of the second of the goals, improve product quality, has yet to be demonstrated to any of the participants. While there is a positive feeling, on the part of the Government personnel, that the product quality improvement is forthcoming, very few respondents had any positive evidence of any quality change attributable to IQUE.

The general feeling was that a period of three years or greater was required before product quality improvements would, or could be realized.

The final goal of IQUE, a reduction in the costs of items and ownership, has not been attained due to the lack of specificity in the goal. The Government QAR sees no change in cost structures that the contractor will pass on to the Government. The contractor sees a more positive future for overall costs, although the current savings are being applied to the increases in costs caused by the implementation of the program.

On the aggregate, the stated goals of IQUE have not been attained although the focus of the program, the spirit of team work, has improved not only processes but also the lines of communication between the contractor and the Government.

The answers to the subsidiary research questions for this research effort are:

What is IQUE? In-Plant Quality Evaluation is the method that Government Quality Assurance Representatives use to assess contractor controls over product quality to ensure acceptance of conforming products. As explained in Chapter II, IQUE is the replacement program for CQAP that focuses on understanding, measuring and analyzing processes, rather than an emphasis on end item inspection. The program is one of the principal initiatives of DCMC in its move toward contractor self-governance.

What are the goals of IQUE? The goals of IQUE are threefold:

1. Achieve customer satisfaction.
2. Improve product quality.
3. Achieve a reduction in the costs of items and ownership.

These goals are those expressed in the forward of DLAM 8200.5, In-Plant Quality Evaluation. The three goals have been defined in order to achieve the primary objective of ensuring the acceptance of conforming products.

What is the reaction of Government contractors to IQUE? The contractor reaction to IQUE has been mixed. Two of the strongest responses by contractors agreeing with the statements had to do with IQUE being an improvement in the method of ensuring conforming products and an impetus in the improvement in the relationship between Government and contractors. The weakest reaction, or least agreement came from the contractors when discussing the reduction of cost statement.

The Government contractors that responded to the research effort had a more positive response to the research statements than did their Government counterparts.

The general reaction was one of relief that the Government had taken a non-adversarial approach to quality assurance relations between the contractor and Government. As related by one contractor in the Cleveland survey:

This is the first time in my thirty years dealing with Government inspection agencies that I have seen an intelligent approach taken to defect prevention utilizing modern statistical methodology.

What have been the negative effects of implementing IQUE?

The negative effects of IQUE have been manifested in the concern demonstrated by the contractor's responses. The most common concern was the limitations of the Government QAR's awareness of manufacturing processes due to the lack of background, training and experience. Another recurring theme in the concerns of the contractors, was the conflicts that IQUE created with quality programs already installed by contractors and that many considered the IQUE program an intrusion on those programs.

What benefits has IQUE provided to DoD and DoD contractors? The largest benefit provided to DoD and DoD contractors has been the increase in channels of communication and the resulting breakdown of the adversarial relationship that has been built between the Government and contractors.

The QAR is now free to focus on areas that will most benefit from the effort. Both the Government and the

contractor respondents felt that IQUE was a more realistic approach to minor problems and built a better understanding of manufacturing processes and trust that allows quality issues to be addressed in the best interest of both parties.

E. AREAS FOR ADDITIONAL RESEARCH

1. Research The Opinions Of Management

This research effort was directed at the opinions of field level personnel. A study of the opinions of supervisory level personnel could reveal different conclusions. The different levels of management could be reviewed to determine if there was any direct influence on the attainment of program goals.

2. Research The Relationship Of IQUE Within Exemplary Facilities

IQUE is just one of the many programs under the umbrella program of Exemplary Facilities. The relationship of the successful implementation of IQUE at a contractors facilities could be compared with other programs to see if there is a commonality between successful programs.

3. Follow Up Research To Review IQUE

This effort reveled some inconclusive findings. A follow-up study that would allow sufficient time to pass before the program was reviewed could resolve those findings.

APPENDIX A SURVEY

This questionnaire is intended as a data collection device in conjunction with the research and writing of a master's thesis. Your participation and contributions are greatly appreciated and will be the central theme of that thesis. Use additional space if necessary.

Employer ☐ Government ☐ Private Industry
Area of Expertise ☐ Quality ☐ Contracts ☐ Other _____

Please indicate agreement/disagreement on a scale of 1-5.

The comment section of each item is provided for any
type of comment not just on the sub-questions provided.

1. IQUE has decreased the number of nonconforming products.
Strongly agree - 1 2 3 4 5 - Strongly disagree
C o m m e n t s : H o w ? W h y ?

2. IQUE has reduced the cost of products.
Strongly agree - 1 2 3 4 5 - Strongly disagree
Comments: What costs? How? Can you provide an example?

3. IQUE has improved the relationship between the Government and industry.
Strongly agree - 1 2 3 4 5 - Strongly disagree
Comments: How? Do you have an example?

4. Product quality has improved as a result of IQUE.
Strongly agree - 1 2 3 4 5 - Strongly disagree
Comments: How? Or Is an improvement anticipated?

5. IQUE has fostered the spirit of teamwork between the Government and Industry.

Strongly agree - 1 2 3 4 5 - Strongly disagree
Comments: Do you have any specifics?

6. The change to IQUE was an improvement in the method of ensuring conforming products.

Strongly agree - 1 2 3 4 5 - Strongly disagree
Comments: How?

7. Government oversight has decreased as a result of IQUE.

Strongly agree - 1 2 3 4 5 - Strongly disagree
Comments: Can you provide an example?

8. IQUE has fostered a "Good News" or teamwork approach to management vice the dictatorial approach.

Strongly agree - 1 2 3 4 5 - Strongly disagree
Comments: Describe.

9. IQUE has reduced inspections.

Strongly agree - 1 2 3 4 5 - Strongly disagree
Comments: How?

10. I received sufficient training in the IQUE program.

Strongly agree - 1 2 3 4 5 - Strongly disagree
Comments: Describe.

11. The number of PQDRs received/processed has decreased.

Strongly agree - 1 2 3 4 5 - Strongly disagree
Comments: Why?

12. More corrective actions are handled on a verbal basis under IQUE.

Strongly agree - 1 2 3 4 5 - Strongly disagree
Comments: Can you provide an example or explanation?

13. IQUE has increased customer satisfaction.

Strongly agree - 1 2 3 4 5 - Strongly disagree
Comments: Why? How?

Any further comments on the IQUE program or the implementation of IQUE would be welcome.

After completion of the survey please place the survey in the envelope provided and place in the return mail.

Thank you again for your participation.

APPENDIX B DIFFERENTIAL ANALYSIS

Table XVI Government Response

Government Response As A Percentage Of Total Response					
Statement	Rating				
	1	2	3	4	5
1	5.22%	16.52%	45.65%	22.17%	10.43%
2	4.78%	11.74%	44.35%	20.43%	18.70%
3	30.43%	37.83%	18.70%	9.13%	3.91%
4	9.36%	24.68%	41.70%	13.62%	10.64%
5	27.66%	35.32%	22.55%	9.36%	5.11%
6	21.74%	32.61%	20.00%	13.91%	11.74%
7	9.52%	24.68%	27.27%	24.24%	14.29%
8	16.23%	32.89%	27.19%	10.09%	13.60%
9	17.18%	35.68%	24.23%	12.33%	10.57%
10	13.66%	24.67%	23.35%	21.59%	16.74%
11	6.58%	10.53%	54.82%	11.84%	16.23%
12	43.56%	36.44%	11.56%	4.89%	3.56%
13	7.08%	14.16%	57.96%	9.73%	11.06%

Table XVII Contractor Response

Contractor Response As A Percentage Of Total Response					
Statement	Rating				
	1	2	3	4	5
1	10.53%	24.21%	46.32%	13.68%	5.26%
2	7.37%	30.53%	34.74%	20.00%	7.37%
3	42.11%	32.63%	13.68%	6.32%	5.26%
4	16.67%	26.67%	40.00%	6.67%	10.00%
5	45.56%	27.78%	13.33%	10.00%	3.33%
6	28.42%	29.47%	28.42%	6.32%	7.37%
7	17.02%	20.21%	36.17%	17.02%	9.57%
8	24.21%	30.53%	31.58%	5.26%	8.42%
9	19.79%	21.88%	25.00%	21.88%	11.46%
10	14.74%	21.05%	34.74%	13.68%	15.79%
11	27.37%	29.47%	35.79%	2.11%	5.26%
12	31.18%	34.41%	16.13%	9.68%	8.60%
13	9.78%	27.17%	50.00%	7.61%	5.43%

Table XVIII Government Differential

Government Differential Analysis					
Statement Number	% Agree		% Disagree		Difference
1	21.74%	-	32.61%	=	-10.87%
2	16.52%	-	39.13%	=	-22.61%
3	68.26%	-	13.04%	=	55.22%
4	34.04%	-	24.26%	=	9.79%
5	62.98%	-	14.47%	=	48.51%
6	54.35%	-	25.65%	=	28.70%
7	34.20%	-	38.53%	=	-4.33%
8	49.12%	-	23.68%	=	25.44%
9	52.86%	-	22.91%	=	29.96%
10	38.33%	-	38.33%	=	0.00%
11	17.11%	-	28.07%	=	-10.96%
12	80.00%	-	8.44%	=	71.56%
13	21.24%	-	20.80%	=	0.44%

Table XIX Contractor Differential

Contractor Differential Analysis					
Statement Number	% Agree		% Disagree		Difference
1	34.74%	-	18.95%	=	15.79%
2	37.89%	-	27.37%	=	10.53%
3	74.74%	-	11.58%	=	63.16%
4	43.33%	-	16.67%	=	26.67%
5	73.33%	-	13.33%	=	60.00%
6	57.89%	-	13.68%	=	44.21%
7	37.23%	-	26.60%	=	10.64%
8	54.74%	-	13.68%	=	41.05%
9	41.67%	-	33.33%	=	8.33%
10	35.79%	-	29.47%	=	6.32%
11	56.84%	-	7.37%	=	49.47%
12	65.59%	-	18.28%	=	47.31%
13	36.96%	-	13.04%	=	23.91%

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